Volume XXXV.
Number 4.

JULY, 1908.

$2.00 per year.
$3.00 with Directory.

TEXTILE WORLD RECORD

Special Features

The Cotton Supply

Designing and Weaving Plain Cloths

Finishing Worsted Top

Standard Sizes of Cotton Underwear

LORD & NAGLE COMPANY BOSTON, MASS.

COPYRIGHT, 1908, LORD & NAGLE COMPANY, REG. U. S. PAT. OFF.

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The Textile-Finishing Machinery Co.

HOWARD BUILDING

STAIRWAYS, 83 EXCHANGE PLACE [ENTRANCES] ELEVATOR, 171 WESTMINSTER ST.

PROVIDENCE, R. I.

BUILDERS OF ALL KINDS OF

MACHINERY

FOR

BLEACHING
DYEING
DRYING

AND

FINISHING

Singeing Machines,

Boiling Kiers,

Washers, Squeezers,

Chemic and Sour

Rusden Patent

Continuous Chainless

Steamer,

Aniline Agers,

Dyeing Machines,

Open Soapers,

Blanket Washers,

Color Kettles,

Horizontal or Vertical Drying Machines, with Copper or Tinned Iron Cylinders,

Automatic Tentering Machines,

Water and Starch Mangles,

Dampening Machines,

Dyeing Machines for Chain Warps.

Calenders for Rolling Glazing, Chasing and Embossing, also Calenders for Moire Finish.

Sole Manufacturers of Patented Flexible Cloth Expander for Cylinder Drying Machines, Calenders, Mangles, &c.

Patent Combination Rolls Made of Cotton and Husk, especially adapted for Soft Finish, Unequalled for Elasticity and Durability.

Cotton, Paper, Husk, Chilled Iron, Brass and Rubber Rolls, Electro-deposited Copper Rolls for all Purposes.

Padding and Drying Machines for Shade Cloths.

Single and Double Cylinder Engines.

Hydraulic Presses and Pumps.

Mercerizing Machinery for Piece Goods and Yarn in the Warp or Chain

ALL KINDS OF OUTFITS FOR BLEACHING THREAD AND SOFT TWISTED YARN.
BLEACHING MACHINERY FOR YARNS IN THE WARP OR CHAIN.

Estimates, Drawings and full particulars of complete plants furnished on application

Southern Agent, STUART W. CRAMER, Charlotte, N. C., Equitable Building, Atlanta, Ga.

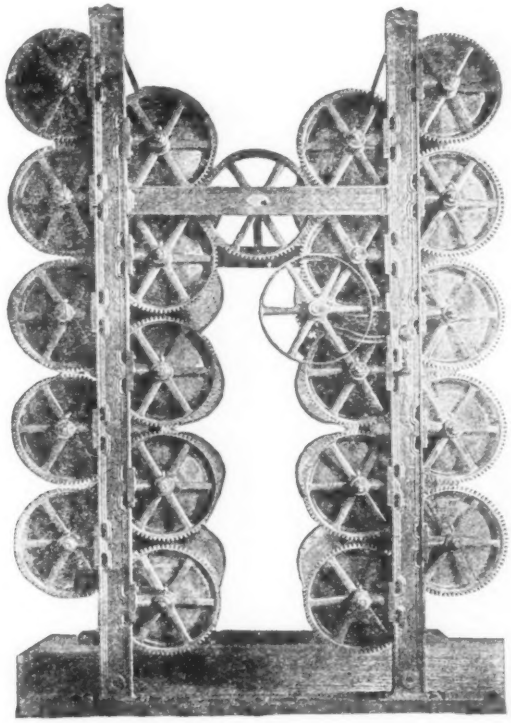
Bleaching,

Dyeing,

Drying,

Finishing,

Machinery



20-Cylinder Drying Machine

for all

kinds of

textile fabrics

H. W. BUTTERWORTH & SONS CO.

PHILADELPHIA, PA.

PROVIDENCE OFFICE, Room 417 Industrial Trust Building

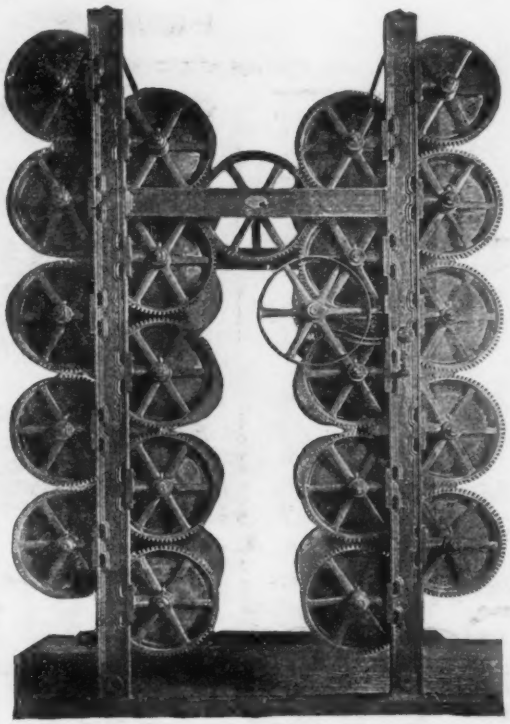
Bleaching,

Dyeing,

Drying,

Finishing,

Machinery



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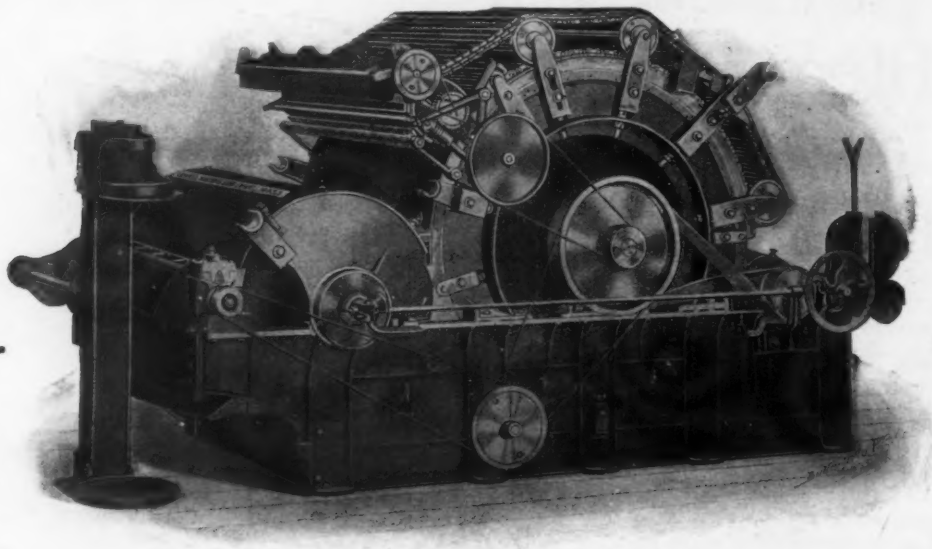


Cotton and Worsted Machinery

With Modifications to Suit Any Class of Work.

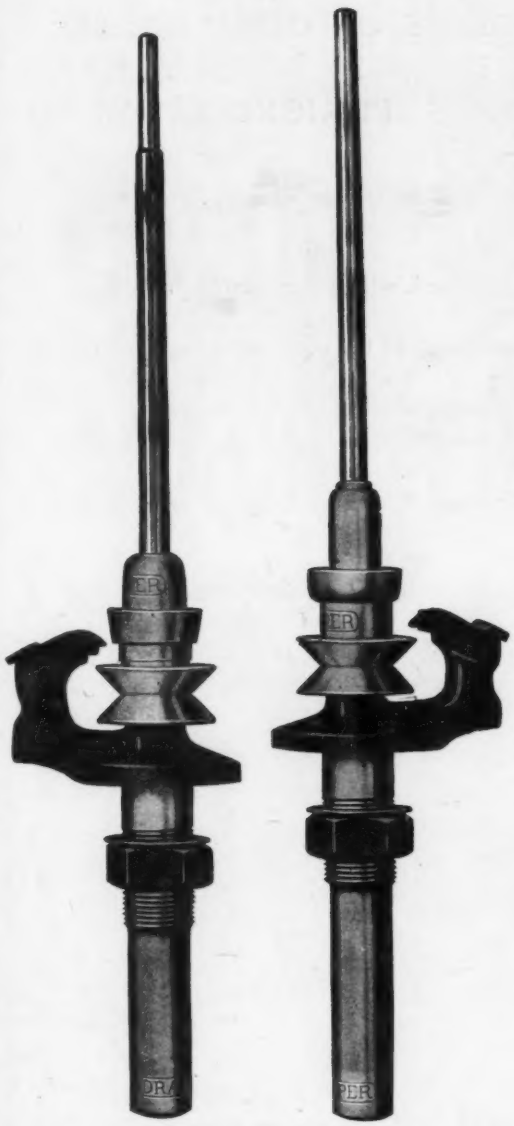
Cotton Machinery: Cards, Railway Heads, Drawing Frames, Fly Frames, Speeders, Ring Spinning Frames, Twisters, Spoolers, Reels, Warpers, Slashers, Winders, Looms, Shearing Machines, Balling Machines, Folders, Stamping Machines, Sewing Machines, Size Pumps, Size Kettles, Drawing-in Frames, Baling Presses, Indigo Grinders.

Worsted Machinery: Spinning Frames with caps, rings or flyers, Dandy Rovers and Reducers, Cone Second Finishers, Reducers and Rovers, Gill Boxes for Drawing, Preparing and Finishing, Weigh Boxes and Drawing Boxes, Cap Trap, Flyer and Ring Twisters.

Plans, Specifications and Estimates furnished upon application.

Lowell Machine Shop

LOWELL, MASS.



Two New
Large Size
Spinning Spindles.

We make

Draper,
Whitin,
McMullan

and other
types of

Spindles;

also

Northrop Looms,

Twisters,
Warpers,
Spoolers,
Reels,

Banding Machines,

etc., etc.

Draper Company,
HOPEDALE,
MASS.

THE EMPHATIC SUCCESS OF OUR "IDEAL" AUTOMATIC LOOM IS DUE TO SEVERAL SALIENT POINTS OF SUPERIORITY OVER ALL COMPETITORS:

1st. The ease and smoothness with which they start up.

2d. The acknowledged superiority of the cloth woven.

3d. Simple and thoroughly mechanical construction, assuring freedom from the constant breakage and expensive repairs attending other automatic looms.

4th. No special bobbins, shuttles or other expensive parts.

5th. Ability to use cop or bobbin filling interchangeably.

6th. Superiority of warp stop motion which does not break or fray the softest yarn.

7th. Of the thousands in operation not a single bobbin or crank shaft broken.

IN PROOF OF CLAIMS WE POINT TO THOSE MILLS FORMERLY USING OUR COMPETITORS' LOOMS THAT ARE NOW USING OURS.

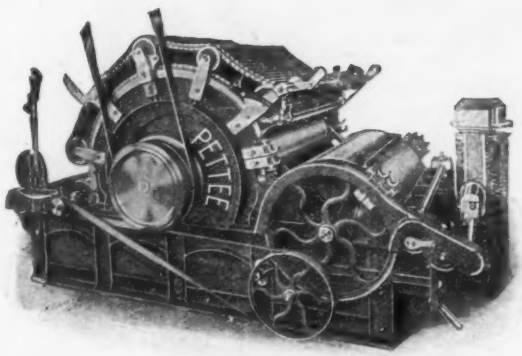
The Stafford Company

Readville, Mass.

Saco and Pettee Machine Shops

NEWTON UPPER FALLS, MASS., U. S. A.

COTTON MACHINERY



Revolving
Flat Cards,
Drawing
Frames,
Railway Heads,
Slubbing,
Intermediate
and
Roving
Frames,
Spinning Frames,
Spoolers
and
Reels.

Shops—

Biddeford, Me.

Newton Upper Falls, Mass.

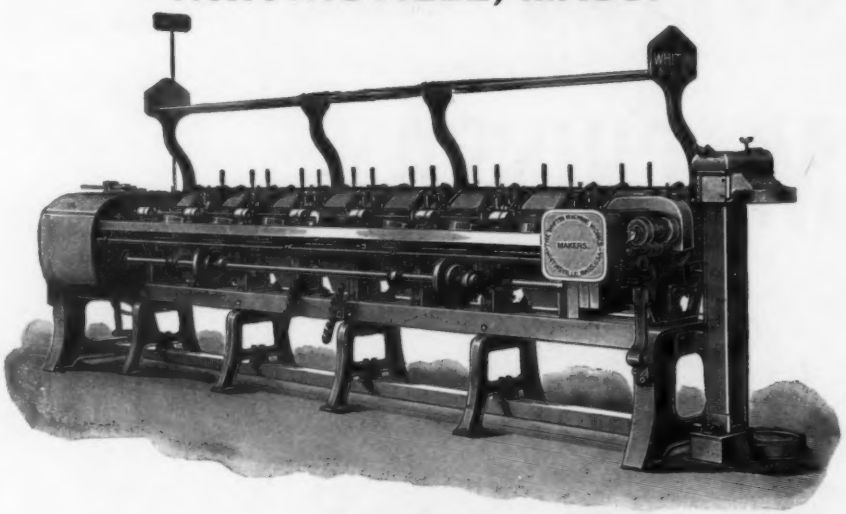
Southern Agent, A. H. WASHBURN, Charlotte, N. C.

THE

WHITIN MACHINE WORKS,

Cotton Machinery

WHITINSVILLE, MASS.



HIGH SPEED COMBER 1906 MODEL.

Revolving Flat Carding Engines,
Sliver Lap Machines,
Ribbon Lap Machines, Combers,
Railway Heads, Drawing Frames,
Spinning Frames, Spoolers, Twisters,
Long Chain Quilling Machines, Reels, Looms.

Southern Agent,
S. W. CRAMER

Trust Building, CHARLOTTE, N. C.
Equitable Building, ATLANTA, GA.

"Kitson Products"

Blowing Systems

For Conveying Bale Cotton
from Storehouse to Picker-room

Self-Feeding Openers
Lappers and
Cleaning Trunks

Waste-Working Machinery

Raw Stock Cotton Dryers

We own the Patterns and can furnish REPAIR PARTS for PICKERS
formerly built by

WHITEHEAD & ATHERTON, . Lowell, Mass.
ATHERTON MACHINE CO., - - Lowell, Mass.
A. T. ATHERTON MACHINE CO., Pawtucket, R. I.

Kitson Machine Shop

Lowell, Mass.

SCOTT & WILLIAMS

2079 E. Cumberland Street, Philadelphia, Pa., U. S. A.

BUILDERS OF

Full Particulars, Samples nnd Special Catalogues on Application.

Rib Knitting Machinery for Underwear and Hosiery

Plain, Single Lever or with Welt, Slack Course and Automatic Slackening Device for Welt.

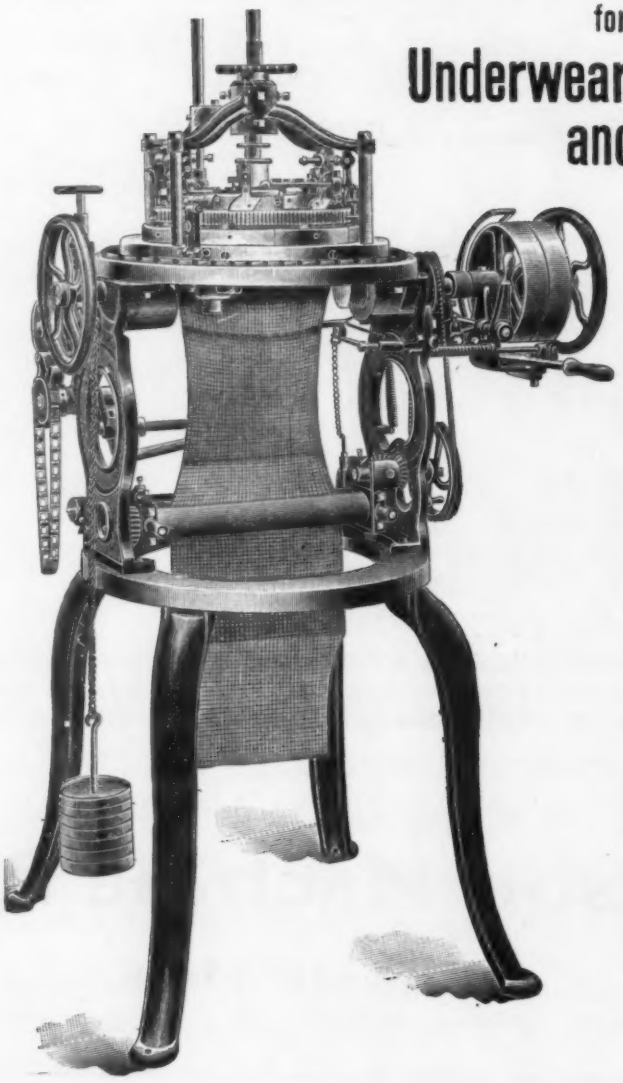
Improved Measuring Device, by actual length knit.

Sizes 8 to 24 inches, inclusive, varying by one inch.

Number of Feeds, 4 to 12, according to style and diameter of machine.

Solid Forged Steel Cylinders, specially hardened or with patent inserted walls for fine fabric.

Special Machinery for Sweaters, etc.



The illustration shows our

Improved High Speed Single Lever Automatic Ribbed Underwear Machine

for making ladies' and gents' ribbed underwear, union suits, etc., plain and shaped.

We build Loopers, Ribbers and other Machinery for Knitting Mills

As well as

A Complete Line of Full Automatic and 7-8 Automatic Seamless Hosiery Machinery.

UNIVERSAL WINDING MACHINES are built of the best materials with interchangeable parts throughout. The great speed at which they can be safely driven gives a maximum "turn-off" per spindle, while scientific design enables the operative to make quick "doffs" thus securing the largest possible production.

"UNIVERSAL WIND" lays soft twist yarn with delicate precision entirely avoiding the rolling and distortion of the twist incident to every form of "friction" or "drum" driven winders. The same yarn will test stronger after being wound on Universal machines than when wound by the drum system.

UNIVERSAL MACHINES are built for coning, tubing, doubling, winding a multiple of ends, braider bobbins, narrow fabric and ribbon loom cops, specialties.

THE NEW No. 90 BOBBIN WINDER adapts the universal system to broad goods. It doubles the shuttle yardage and reduces the number of seconds in the weaving of woolens, cotton and silks.

Universal Winding Company

95 South Street, Boston, Mass., U. S. A.

INTERNATIONAL WINDING COMPANY

Saville St., Oxford Road, Manchester, England

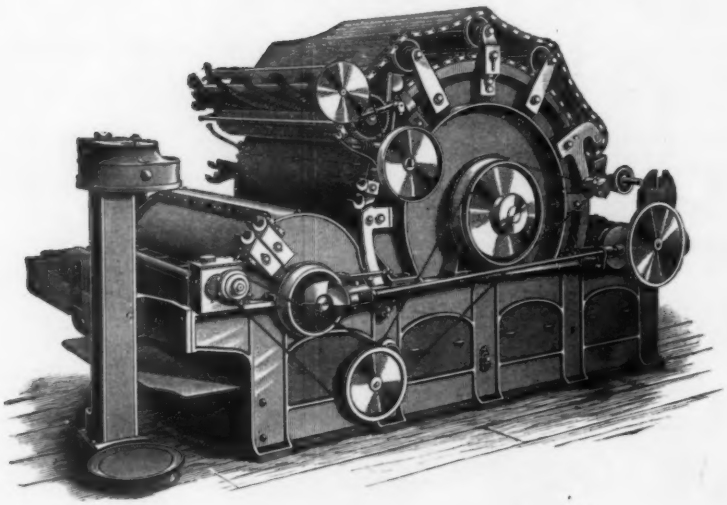
16 St. Johannvorstadt, Basel, Switzerland

Cotton Machinery

MASON MACHINE WORKS,

TAUNTON, MASS.

Southern Office,
Charlotte,
N. C.



Cards,
Combers, Railway
Heads, Drawing Frames
Spinning Frames, Mules and Looms

INCLUDING

Plain and Fancy Silk Looms

EVAN ARTHUR LEIGH

232 Summer Street (opposite the South Station), Boston, Mass.

SOLE AGENT

IN THE UNITED STATES AND CANADA FOR

Platt Bros. & Co., Ltd.

BY FAR THE LARGEST MAKERS IN THE WORLD OF

Cotton, Woolen and Worsted Machinery

Platt's Patent Opening and Picking Machinery.
Platt's Cotton Comber will comb from 7-8" stock to Sea Islands.
Platt's Special Machinery for Making Cotton Waste into Yarns.
Platt's Special Machinery for Making French Worsted Yarns.
Platt's Woolen and Worsted Carding Engines, Special Designs.
Platt's Cotton, Cotton Waste, Woolen and Worsted Mules.

MATHER & PLATT, LTD.

Dyeing and Finishing Machinery.
Archbutt-Deeley System for purifying and softening water.

TEXTILE MACHINERY ASSOCIATION, LTD.

Flax, Hemp and Jute Machinery.

GEORGE HODGSON, LTD.

Looms for Worsteds, etc.

THE PATENT AUTOMATIC FEEDING MACH. CO., LTD.

Patent Feeding Machines for wool, cotton, flax, fur and fibrous material.

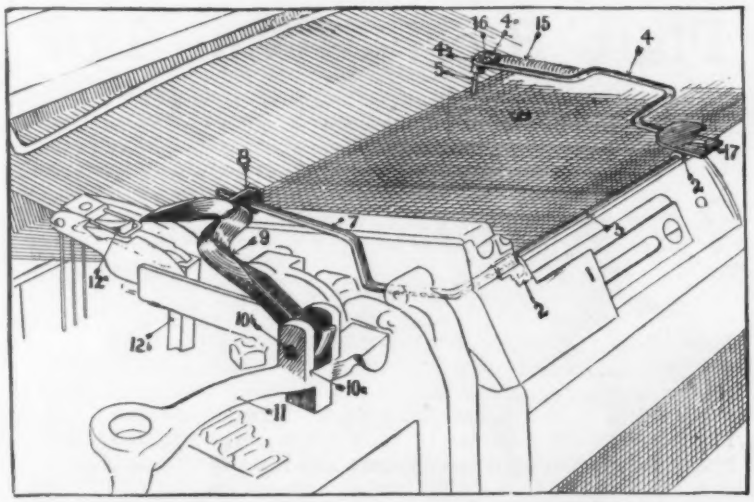
JOSEPH SYKES BROS.,
Card Clothing for Cotton.

JAMES CRITCHLEY & SON'S.
Card Clothing for Woolen and Worsted.

DRONSFIELD BROS'.
Grinding Machinery and Emery Filleting. The Best French and English Combing and Rubbing Aprons. Harding's Pins and Circles. Varey's Fallers, etc.

RELIEF FROM

Thin-Places on Automatic Looms



A prominent cotton mill official writes as follows:

"Replying to yours of the 23rd, would say that after thoroughly experimenting, we placed your AUTOMATIC THIN-PLACE PREVENTER on ALL our looms, and are well pleased with the result." . . . .

The ALL in this mill means 2057 Single Fork Automatic Looms, and 819 Double Fork Automatic Looms.

49 mills sold to date. Would you like to be mill number 50 to get RELIEF FROM THIN PLACES ON YOUR AUTOMATIC LOOMS?

Manufactured by

CLAYTON & BENTLEY CO., Atlanta, Ga.

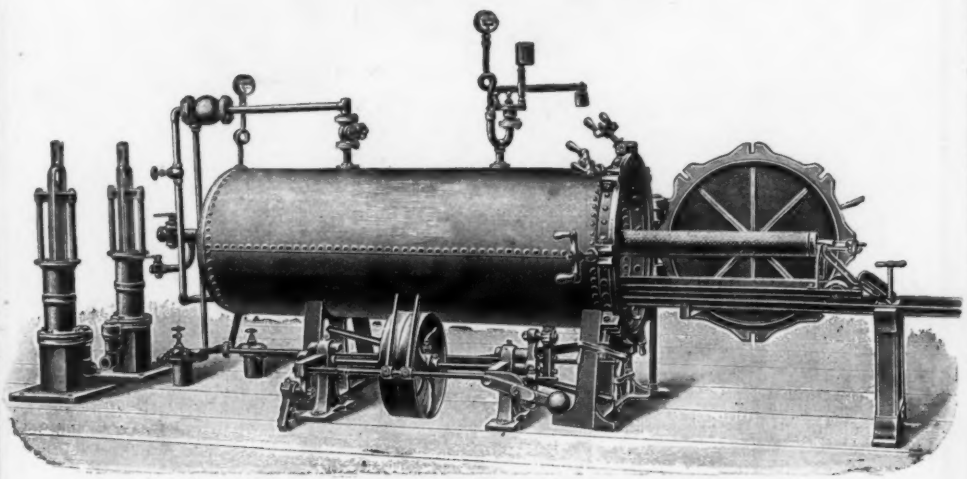
Cockled Cloth Positively Prevented

and a

Permanent Stainless Lustre Secured

by using this

MACHINE



Write for particulars

L. H. A. Schwartz & Co., 141 Milk Street, Boston

American Agents

Built by Paul Klug Machine Works, Crimmitschau, Saxony

Now is the Time to Equip With New Process Noiseless Pinions

There are doubtless some places about every plant where the racket made by metal gears is a nuisance and the quiet running of New Process Noiseless Pinions would be a vast improvement. The pressure of business, however, for the past two years has kept most factory managers so busy that they have had no time to consider such refinements of their equipment. The present slackening in the rush should be taken advantage of to look into this matter and to prepare to have the benefit of Noiseless Gearing during the busy times which are soon to come. We will be glad to send our descriptive catalog for the asking.

The New Process Raw Hide Company

Syracuse, New York

JAMES HUNTER MACHINE CO.

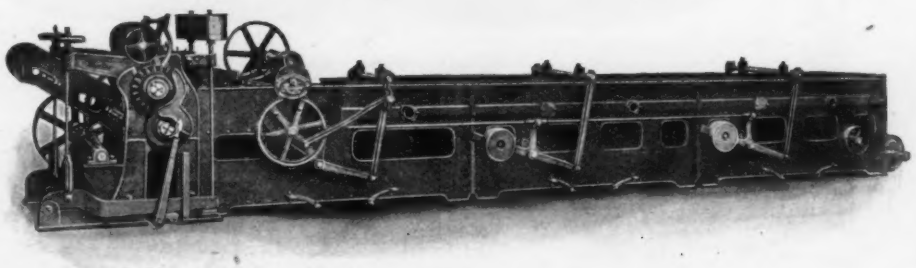
NORTH ADAMS, MASS., U. S. A.

Wool Washers. *Bulletin 54*

The Hunter

MODEL D

WOOL WASHER



"ASK ANY USER"

Bulletin 54 describes it

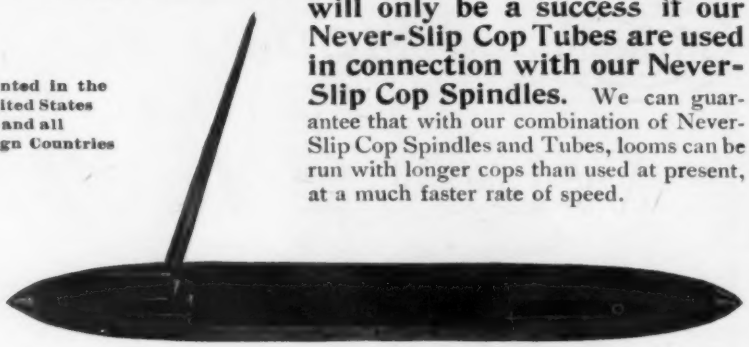
Never-Slip
Cop Spindles and Tubes

Never-Slip Cop Tube

Patent applied for.

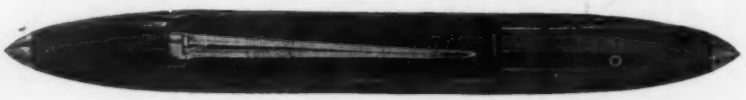
Filling-Waste is reduced to nothing and long Cops will only be a success if our Never-Slip Cop Tubes are used in connection with our Never-Slip Cop Spindles. We can guarantee that with our combination of Never-Slip Cop Spindles and Tubes, looms can be run with longer cops than used at present, at a much faster rate of speed.

Patented in the United States and all Foreign Countries



Shuttle with Spindle Raised

U. S. Patents: 778851, Jan 3, 1905; 790611, May 23, 1905; other patents pending



Shuttle with Spindle Lowered

U. S. Patents: 778851, Jan. 3, 1905; 790611, May 23, 1905; other patents pending

American Textile Specialty Machinery Co.

MANUFACTURERS OF

Shuttles and Shuttle Irons for all Textile Purposes.

New York Office, 363-373 Rider Ave.

670 Eddy St., Providence, R. I.

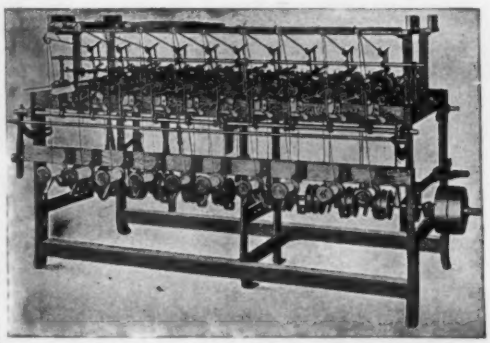
OSWALD LEVER CO.

(Formerly LEVER & GRUNDY.)

Lehigh Ave. and Mascher Sts., PHILADELPHIA, PA.

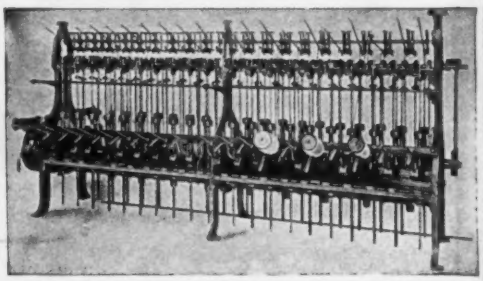
MANUFACTURERS OF TEXTILE MACHINERY.

SOLE MAKERS OF OUR PATENTED SPECIALTIES IN THE UNITED STATES.

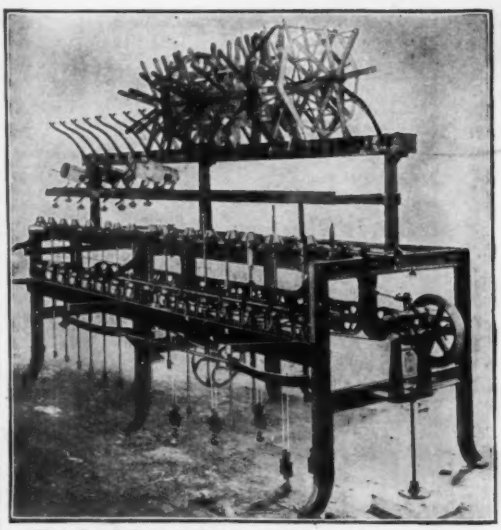


This Machine may be arranged to wind from skeins, spools, cones, or any kind of spinning bobbins. Most suitable machine for cotton or woolen blankets.

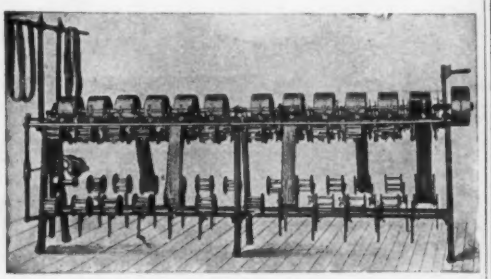
Conical and Parallel Tube Winding Machines; Warping Machines and Creels; Brass Bobbin Winding and other Machinery for lace mills; Chenille Cutting Machines, Sectional Warping Mill, Beaming Machines, etc; Cop Winding Machines for butts to weave from outside; Filling Bobbin or Quill Winding Machines; Vertical Spindle Spooling Machine for silk, fine cotton, wool and worsted; Variable Speed Bobbin Machines for large bobbins used in knitting mills; Dresser Spooling Machines; Reeling Machines.



Vertical Spindle Gear Driven Winder, as used by all manufacturers of heavy duck, jute, cotton, bagging and carpets.

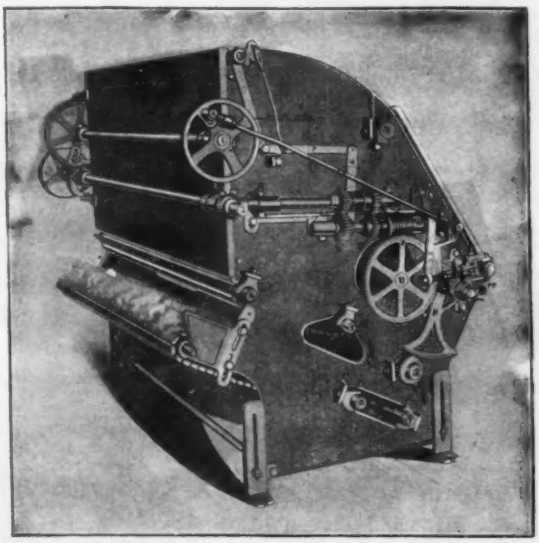


High Speed Cross Quiller to wind from skeins, spools or mule cops on two quills or paper tubes. It is built to run from 1800 to 2400 revolutions.



Pressure Drum Spooling Machine. This machine is adapted for spooling any kind of yarn, whether from mule cops or skeins.

THE FISHER PATENT CARD FEED



Write Us For List of Mills Where Machines Are Used.

Woonsocket Machine and Press Company

WOONSOCKET, R. I.

PRACTICAL FIRE PROTECTION

If you want your mill buildings properly protected against the fire hazard, thereby obtaining the lowest insurance rates, you must have a supply of water which is instantly available under high pressure and absolutely independent of the successful or immediate operation of pumps or other machinery. The old method of storing such a supply was by wood tanks, generally built on top of buildings. As these tanks are short lived they soon become, themselves, a menace to the building instead of a protector. The sudden bursting of such a tank has often done as much damage as a fire. The up-to-date method of storing water is by means of a steel tank on a steel tower. We make a specialty of the design, manufacture and erection of these tanks of any desired capacity, in any part of the country, to meet any local conditions. Our tanks are recommended by the Factory Mutual Insurance Companies and endorsed by all of our past customers. We have built about seven hundred towers and tanks in all parts of the country, about 50 of which have been erected for Textile Mills. Every one of these is giving satisfaction. Write for booklet No. 7 which gives a list of all our customers with whom we invite you to correspond. The cut shows a tank which we built for the Belton Cotton Mills, at Belton, S. C. The large tank is kept full at all times for fire protection; the small one supplies water for use in the buildings.

Chicago Bridge and Iron Works

105th and Troop Sts. Chicago, Ill.

ESTABLISHED 1865.

Jacob K. Altemus

TEXTILE MACHINERY

Office: 2824 North 4th Street, Philadelphia Pa.

To Rewind Filling Yarn To Obtain Loom Production.

The vital question of cost of rewinding, can be readily and fully determined in every detail by sending samples of yarn to be converted to the shuttle with the bobbins that are in use.

Do not require special bobbins for any special type of machine.

Meet all conditions and are ready to show the saving by what we can reproduce.

TAPES, BRAIDS AND RIBBONS

for the Mill and Manufacturing Trade

WICK NARROW FABRIC CO.
PRODUCERS OF SPECIALTIES
726-728 Market Street, Philadelphia
Address Department Z

STARCH.

Increased efficiency in

WARP SIZING

with LESS COST by using

Adhesive Value:

One pound of "C. P. SPECIAL" contains a sizing value of from one to one and a half pounds of any other starch.

"C. P. SPECIAL" requires no heavying or stocking up after standing.

Sizing Qualities:

"C. P. SPECIAL" dries without sticking on slasher cylinders.

"C. P. SPECIAL" penetrates yarn thoroughly.

"C. P. SPECIAL" increases tensile strength of yarn from 5–10 percent.

"C. P. SPECIAL" boils quickly and produces good, smooth size.

Weaving:

Warps sized with "C. P. SPECIAL" draw in and weave to entire satisfaction.

"C. P. SPECIAL" will not dust off under your looms.

Demonstration:

We are ready to demonstrate in your mill—free of cost—just what "C. P. SPECIAL" will do.

100 lbs. "C. P. SPECIAL" will be sent on request to any responsible Cotton Manufacturer for demonstration purposes.

Corn Products Refining Co., New York, N. Y.

1000 Gallons of Soft, Pure Water

20 Barrels for Two Cents

for 2c.

That is the average cost of making hard water soft with the

Dodge Automatic

"EUREKA"

Water Softener and Purifier.

for 2c.

For the price of a postage stamp you secure 1000 gallons of a water that will produce

Level Dyeing.

The wool is *clean* because it has been scoured and washed in water that is free from impurities that adhere to the wool, consequently the coloring matter can penetrate and affix itself in *every* portion of *every* fibre, and no *spots* or *streaks* mar the appearance of the finished piece.

Consider the SOAP SAVING—it amounts to the difference between the soap required to produce "suds" on your *hard* water as against practically a RAIN water.

It is not necessary to "doctor" our treated water.

We can CLARIFY your turbid river or lake water. By using the treated water in your boilers, as well as in the manufacturing processes, you prevent scale and all of its attendant evils and expenses.

A postal card request will bring you our interesting book "No. 414" which tells all about the "Eureka" System.

Dodge Manufacturing Co., Mishawaka, Ind.

P. S.—These are some of our textile mill customers:—

South Bend (Ind.) Woolen Co.
Cooper, Wells & Co., St. Joseph, Mich.
Burson Knitting Co., Rockford, Ill.
Kalamazoo Knitting Co., Milwaukee, Wis.
Des Moines, (Ia.) Hosiery Mills.
Ipava (Ill.) Woolen Mills.
Clinton (Mich.) Woolen Mfg. Co.
Wayne Knitting Mills, Fort Wayne, Ind.

"CROSS CREEK" Sixes

For some time we have been calling your attention to the bonds of the Cross Creek Coal Company which owns 7000 acres of land in fee, simple, underlaid with the "Battle Creek" seam of coal, and now we beg to submit these photographs of the actual workings and conditions in the "Battle Creek" seam.

"Battle Creek" — note the ease of working.

A limited amount of the bonds are still unsold.

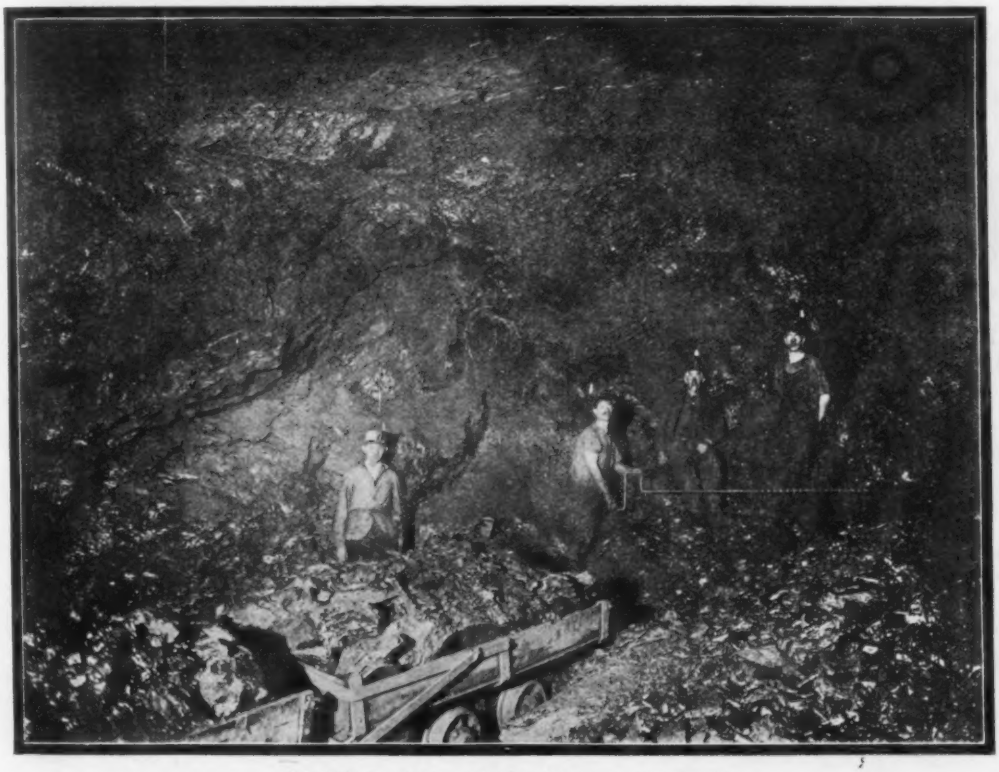
Write for full particulars.

Cross Creek Coal Company,

1006 Mutual Life Bldg., Buffalo, N. Y.

"CROSS CREEK" Sixes

These flash-light pictures were taken within the last few days and are the best evidence of the great thickness of the vein and the excellent quality and large blocky structure of the coal. This coal costs less than $.95 to put on the cars and the average selling price is about $2.00 a ton; leaving a net profit of something over $1.00 per ton.



"Battle Creek" — note the thickness of the vein.

A limited amount of the bonds are still unsold.

Write for full particulars.

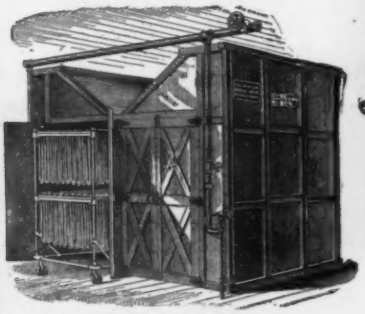
Cross Creek Coal Company,

1006 Mutual Life Bldg., Buffalo, N. Y.

"HURRICANE" DRYERS AND FANS

For Wool, Cotton Stock, Yarn, Stockings, Underwear, Etc.

Power Screw Hydraulic and Lever **Presses**



Truck Yarn Dryer.

BELT DRIVEN AND MOTOR DRIVEN

"Hurricane" Fan, Style No. 2. Write for Catalogues.

COMPLETE EQUIPMENTS FOR DYEING, SCOURING, BLEACHING, CARBONIZING, OXIDIZING, CHROMING, Etc.

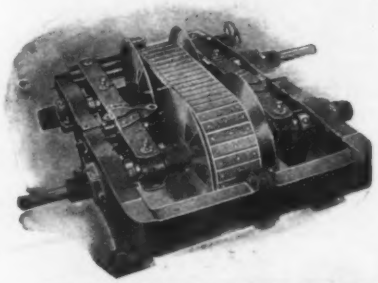
PHILADELPHIA DRYING MACHINERY CO.

6721 Germantown Ave., Philadelphia, Pa.

The QUALITY of the goods, as well as QUANTITY, is determined by the methods of manufacture.

THE MILL EQUIPPED WITH

"The Reeves" Variable Speed Transmission



for regulating the speed of the tenters, dryers, mangles, printing, bleaching, dyeing and mercerizing machines, etc., produces the best and the most at the lowest cost, because it gives the ***exact speed*** best suited to the work.

ASK THOSE USING IT.

REEVES PULLEY COMPANY,

Columbus, Indiana.

New England Agents,
Cell Drier Machine Company,
Taunton, and 147 Milk St., Boston, Mass.

New York Representatives,
Patterson, Gottfried & Hunter,
146-150 Centre Street.

LAWSONS

Hope Foundry, LEEDS, England

BRANCH OF

Fairbairn Lawson Combe Barbour, Ltd.

MAKERS OF MACHINERY FOR

Preparing and Spinning

Flax, Hemp, Tow and Jute

Special Machinery
for the Manufacture of
Twines, Rope Yarns and Binder Twine

Good's Combined Hackling and Spreading Machine.

Long Reach Screw-Gill Drawing Frames. Chain-Gill Drawing Frames with Apron Heads.

Patent High-Speed Horizontal and Automatic Spinning Frames for Manila.

Improved Laying Machines.

Haskell-Dawes Tubing Twisters.

Brownell's Patent Twisting and Laying Machines for Twine.

N. B.—Complete Plans and Estimates for Flax, Tow, Hemp and Jute Mills, Trawl Twine Factories and Steam Ropeworks.

Palmer's Improved Adjustable Thread Guide

For Ring Spinning and Twisting

This guide supplies an accurate, rigid and permanent adjustment, and is attached to the ordinary spinning frame clapper. It has more merits than any other adjustable guide and at a greatly reduced cost. Perfect adjustment saves broken ends, abnormal wear of the rings, and increases the production and quality. Will soon pay for itself.

A Radical Departure in Twisting Guides.
Insures the Greatest Economy in Twisting, Saves Power, Lays the Fibre Closer, and Makes a Smoother Thread.

Applied and Adjusted in the same way as the Wire Guide shown herewith.

Send for free sample and circular.

Patented in United States, July 24, 1906; April 9, 1907; and June 4, 1907. Japan, Oct. 12, 1906. France, October 2, 1906. England, Sept. 13, 1906. Spain, July 23, 1906. Belgium, July 24, 1906 and Italy.
Patents applied for in the United States, Germany, Switzerland, Austria, Russia, Poland and India.

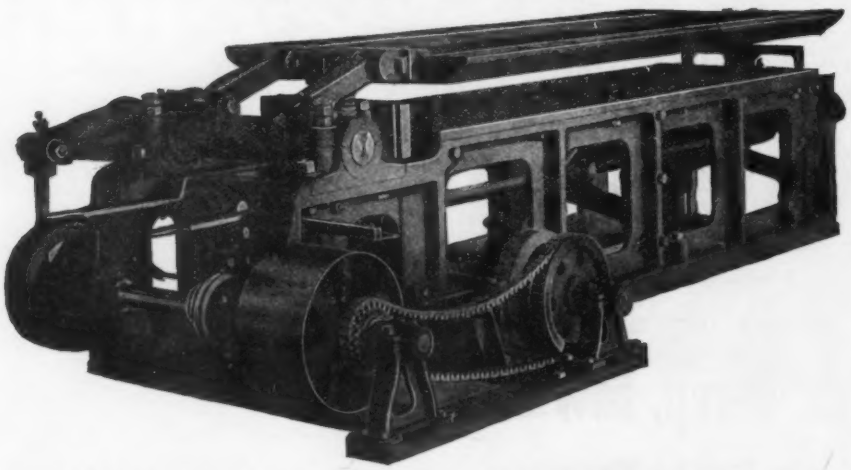
Patented and Manufactured by

The I. E. Palmer Co.

Middletown, Conn., U. S. A.

Farrel Foundry & Machine Co.

ANSONIA, CONN.



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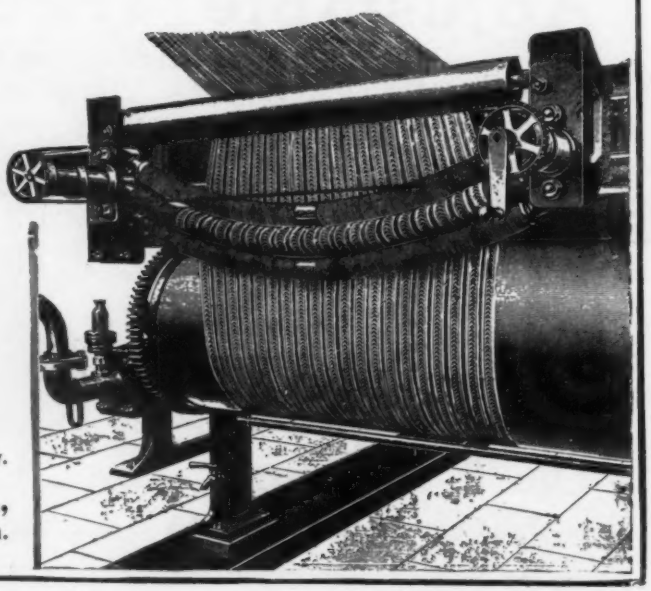
Chilled and Soft Iron Rolls. Heavy Transmission Machinery.
Machine Moulded and Machine Cut Gearing, to 20 ft. diameter, Etc., Etc.
Heavy Castings, in Gray Iron or Semi Steel.

Perfectly Even Tension Both Ways

THIS ideal cloth expander gets the full width of the goods in a most satisfactory way. Can be attached to calenders or cans. Hundreds in use in Great Britain and on the Continent—hundreds more in the United States, with constant satisfaction.

Manufacturers unsolicited say to us, "You have the greatest thing in a spreader ever brought to our attention."

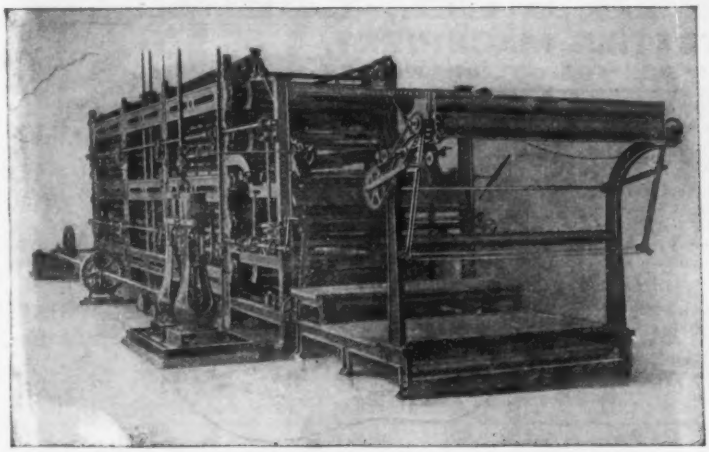


We put them in on trial.
Test it on your own work—'t will pay.

Thomas Leyland & Co.,
60 India St., - - - Boston.

TENTERING AND DRYING MACHINES

WITH LOW DOWN FEED. PATENTED FEBRUARY 26, 1895.



Tentering and Drying Machines on Pipe System. Special Dryers for Heavy Felt Goods. Hot Air Drying and Tentering Machines.

Fulling Mills, Washers, Chinchilla and Whitney Machines, Whipping Machines, Cone Willows, Marsden & Blamire Lap Feed, Dyeing Machines for Piece Goods, Soaping Machines, Wringing Machines, Jigs (Double or Single), Dewing Machines, etc. Crabbing Machines for worsted. Made either single, double or triple.

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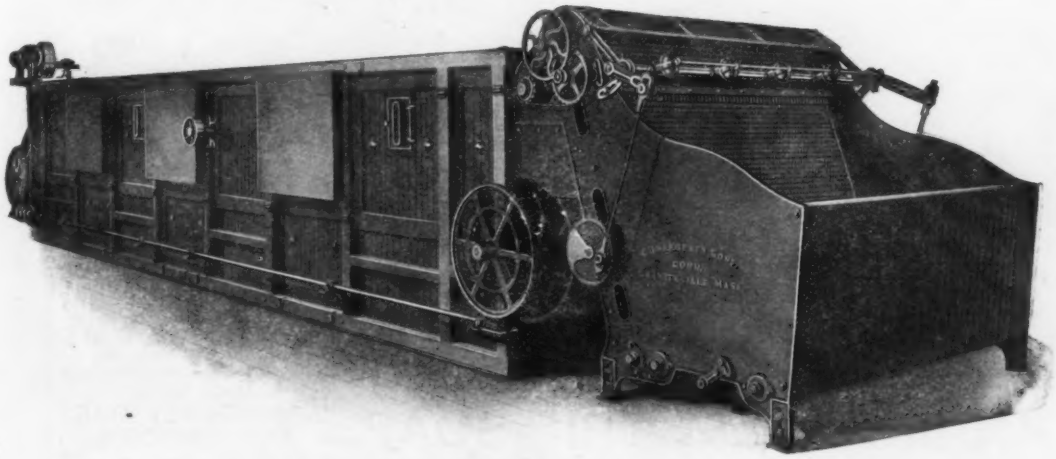
GRANITEVILLE, MASS.



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ASA LEES & CO., Limited,

TEXTILE MACHINERY,

OF EVERY DESCRIPTION FOR COTTON, WOOLEN AND WORSTED.

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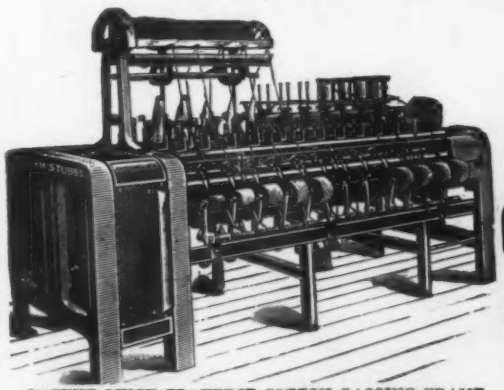
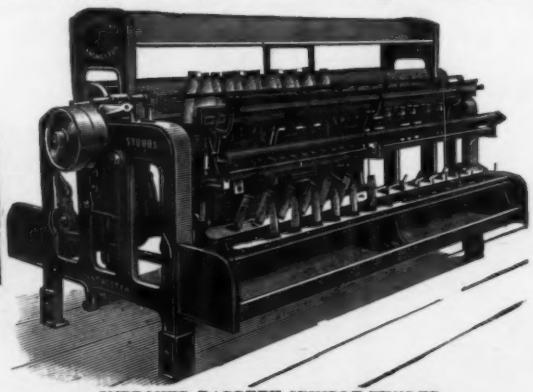
For Winding, Gassing, Reeling, Preparing, Polishing and Bundling Yarns.



PATENT QUICK TRAVERSE COTTON GASSING FRAME.



IMPROVED RABBETH SPINDLE WINDER.
With Patent Tapering Motion, for Single Flanged Bobbins.

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DOBBINS' ELECTRIC SOAP, ABSOLUTELY PURE AND UNIFORM.

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FREE SAMPLE SENT FOR TRIAL ON REQUEST.

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With Electric Motors Direct Connected To Textile Machines

in case an accident happens to any machine or to any part of the driving mechanism, only one machine is put out of service, whereas with the usual belt-driven arrangement, if the main belt breaks, or any of the shafting fails, the entire section comprising many machines, has to be shut down, with a resulting reduction to output.

Ask Westinghouse Electric
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Westinghouse Electric & Mfg. Co.

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There is no Wear-out to

Shultz Sable Belts

A Shultz Sable Rawhide Belt drove a generator steadily for twenty years in the plant of the LaCrosse (Wis.) Electric Light & Power Co., and then, when their plant was dismantled, the belt was still worth shipping 2000 miles to Cascade Locks, Ore., where it served the Wind River Lumber Co.'s mills until destroyed by fire three years later.
This performance is not remarkable for Sable Belting, because Sable is free from the destructive internal faults which ruin the ordinary belt.

Send for a Sable Rawhide Belt for 60 Days Free.

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EASTON AND BURNHAM MACHINE CO.

PAWTUCKET, R. I.

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To the Manufacturer who Invites Success!

THE HENDERSON CARD

will increase your carding and improve the quality of your yarn with less waste, greater strength and increased production over any other system.

James H. Whittle Co. 150 Harlow St., Worcester, Mass

Successors to the Cleveland Machine Works

Owners and manufacturers of the celebrated **Henderson Card** for Wool, Worsted, Cotton, Waste, Flax and Asbestos. Also manufacturers of

All Kinds of Woolen Machinery.

15 to 200 H. P.

We are thoroughly familiar with the electric requirements of textile mills.
This is one reason why **C-W** induction motors make good in this field.
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NEW ENGLAND BUTT COMPANY,

304 PEARL ST., PROVIDENCE, R. I.

BRAIDING MACHINERY

ALL STYLES AND KINDS FOR FLAT AND ROUND BRAIDS.

SOLID SASH AND CURTAIN CORDS,

SHOE AND CORSET LACES, BANDING

AND ALL BRAIDED FABRICS.

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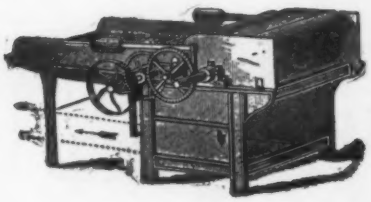

Lumpers,

Wool and Waste Dusters,
Rag Dusters, Nappers.
Improved Cloth Measuring Machines.

Lumper and Duster Cylinders Refilled and Repaired.

Arachidelle Creme

For Softening Woolen and Worsted Yarn in Spinning

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THIS is an absolutely pure and neutral product and leaves no stain or residue of any kind. It helps the spinning amazingly and the natural elasticity of the wool is retained perfectly in the yarn. Widely used by the best spinners of Europe and by many spinners in America, particularly those with foreign connections and experience. Mixes with any proportion of water.

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Pure, soft water decreases the cost of Dyeing, Bleaching and Finishing

There is perhaps nothing used in textile processes that causes loss in so many ways as hard, impure water, and yet every textile manufacturer can have water perfectly suited to his needs (no matter what his source of supply) at merely nominal cost by using a

Bartlett Water Softener

The use of pure soft water is a vital question of mill economics. Let us send you a booklet that contains much of interest pertaining thereto.

Northern Water Softener Company

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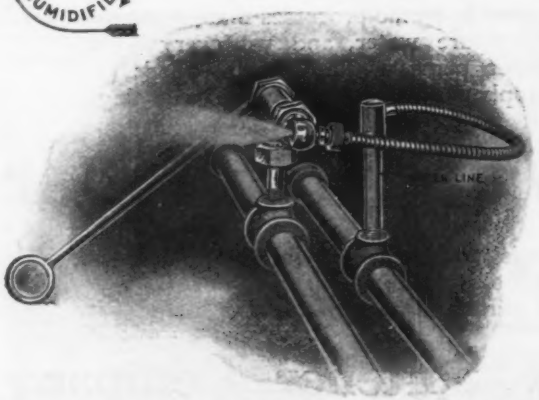
BULLETIN ON ESSENTIALS OF ROPE DRIVING

NOW READY FOR DISTRIBUTION. SEND FOR COPY

The Turbo-Humidifier

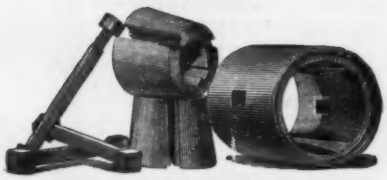
TURBO TRADE MARK HUMIDIFIER

"The Dirtiest Room in the place—now as clean as a Cloth Room"



One manufacturer, who was skeptical about the Turbo-Humidifier in a low posted card room, directly over English cards and drawing frames, writes that this room, formerly the dirtiest room in the place, is now as clean as a cloth room.

The G. M. PARKS COMPANY, Sole Agent
Fitchburg, Mass.



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DOUBLE CONE VISE COUPLING

has a way of holding shafts together, that no other COUPLING can equal.

WILLIAM SELLERS & CO., INCORPD.

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Makers of

SHAFTS,
COUPLINGS,
PULLEYS,
HANGERS,

and all most approved appliances for the Transmission of Power.

SEND FOR CATALOGUE AND PRICE LIST.

MACHINE TOOLS.
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Patented in the United States and Foreign Countries.

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WROUGHT STEEL

PULLEY

Is a parting PULLEY and can be applied without stripping the shaft.
It is Light, STRONG, and lasts a lifetime.
It clamps to the shaft perfectly—keys and set-screws superfluous.
Interchangeable metal Bushings to fit shafts of different sizes.
Particularly adapted to TEXTILE manufacturing.
Sold by the Leading Supply Houses all over the WORLD.

Send for Booklet.

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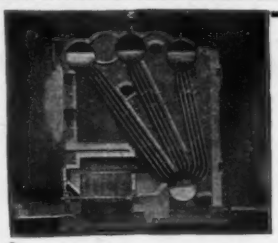
29th and Bristol Sts., Philadelphia, Pa.



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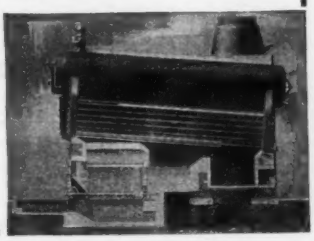
Burns Slack with Great Economy

The Murphy can be installed under any type of fire-tube or water-tube boiler and to units of any size.



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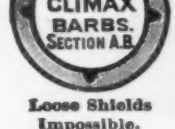
MURPHY IRON WORKS

DETROIT, MICH.

WILSON & CO., BARNSLEY, Limited

Absolutely secure combination of Shield and Bobbin guaranteed.

Loose Shields Impossible.



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GOLD MEDAL St. Louis, 1904. DIPLOMA d'Honneur Liege, 1905. Highest Awards for Bobbins.

Added Strength and Absolute Security.

Samples and Prices on Application.

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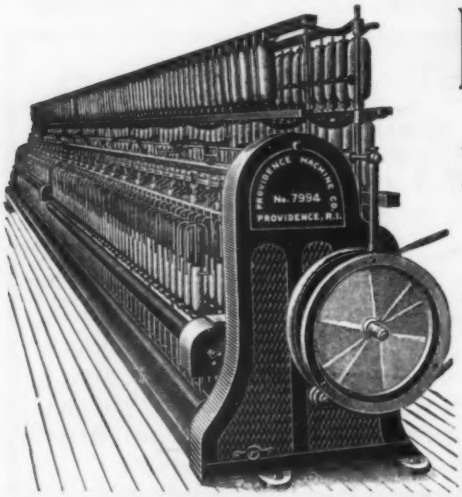

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Manufacturers of

Improved Cotton Roving Frames

Improved Worsted Roving Frames

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Continuous Daylight for Your Mills

is obtainable by the use of

General Electric Arc Lamps with Concentric Diffusers

This system is best because it is the only mill lighting system that gives a perfectly distributed light that is **Similar to Daylight.**

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Is the largest manufacturer of HUMIDIFIERS in the World. The last twenty years receiving the HIGHEST AWARD in this country and Europe for its AIR-MOISTENING SYSTEM. EIGHT GOLD MEDALS and others.

The Only Perfect System of Air Moistening

Has Been Adopted by the Representative Manufacturers of this Country.

The only System adopted in the Textile Schools. Write for booklet "T" on Humidification.
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Established 1841
COPPERSMITHS

STEAM JACKET KETTLES

Guaranteed to stand 150 lbs. cold-water test

Equal, if not Superior, to any in the market.

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BOSTON,
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It Attracts Universal Attention Because it is THE BEST

BADGER'S
Fire Extinguisher

Has taken the lead in the United States, and is everywhere recognized for its efficiency. After competitive tests, lasting more than one week, THE UNITED STATES GOVERNMENT placed an order for 1,200 of

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Crabbing, Steam Finishing, Opening and Folding,
Tacking, Sewing, Squeezing Machines

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Bleaching and Napping Machinery

Hydro-Extractors, Exhaust Fans, Dye Tanks and Tubs

Adjusts itself to an uneven load, runs without vibration
Unusual capacity for high-class work

Bridger Hydraulic Cutting Press

Send for Catalog

Tolhurst Machine Works
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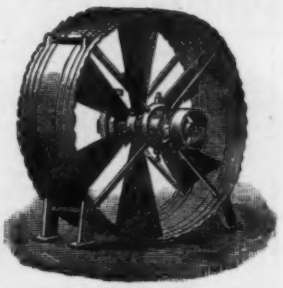

Moves more air than any other fan made. Very efficient under widely varying conditions. Noiseless and does not obstruct the light

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The "BODDEN" Flyer

For QUALITY OF FINISH
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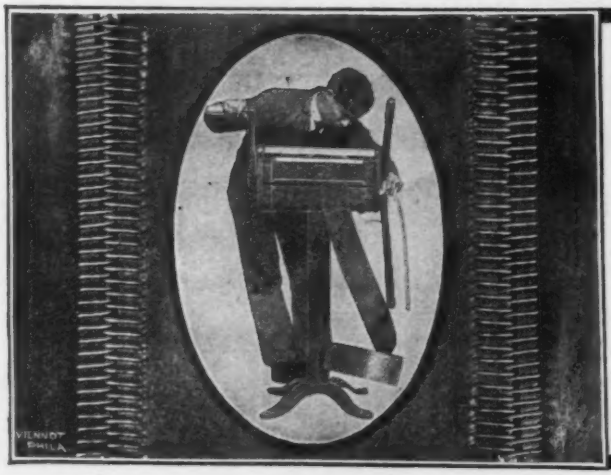
HAS STOOD THE TEST OF YEARS

Sole Agents for U. S. A.

Thomas Mayor & Son, Olney Street, **Providence, R. I.**



The Jackson Belt Lacer

is here shown in operation. The background is an actual photograph of a six-inch belt laced the

"Jackson Way."

Looks good, doesn't it? *It is good.* More than that it's economical—a six-inch belt can be laced in three minutes at a cost for material of less than one cent, and the joint will stand 3800 lbs tension.

Illustrated Catalog on request.

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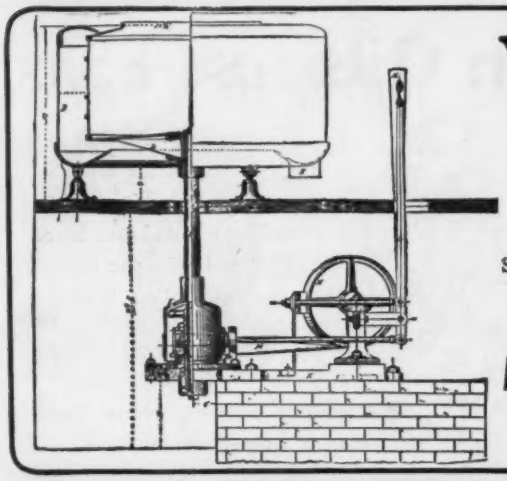
Birdsboro, Pa.



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Special Machines for Acid Work.

SHAFTING, PULLEYS,
FRICTION CLUTCHES, Etc.

American Tool and Machine Co.

Incorporated 1864. Founded 1845.

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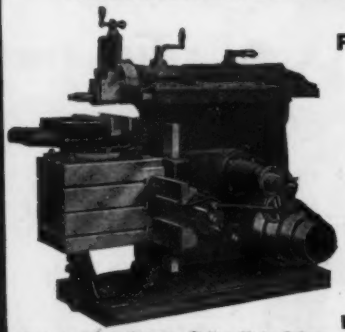
"AMERICAN" MACHINE TOOLS



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FOR **HIGH CLASS** and **QUICK**
Machinery Repairs
IN YOUR OWN PLANT

WONDERFUL SAVING POSSIBLE

Catalog "N" Now Ready

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300 to 350 New St., Cincinnati, U.S.A.

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The Cotton Duck used in Lane Baskets

is extra quality, extra heavy weight, woven close and hard. Its great tensile strength, smoothness and impenetrability make it a most desirable and ideal material for this use.

Sold direct or through principal Supply Houses.

See our Descriptive Catalog and Price List No. 37.

FIG. 20.

MANUFACTURED ONLY BY

W. T. Lane & Brother, Office & Works **Poughkeepsie, N. Y.**

Pure Breton Oils Sure

In "Breton" Oils all chance and luck have been eliminated as they are scientifically compounded of the best materials in a way to meet the most difficult requirements. In constant use for over 25 years by leading mills.

By using "Breton" Oils you are sure to obtain the same results, as each brand is made for a particular use and each barrel of that brand will get the results desired. Test it at our expense.

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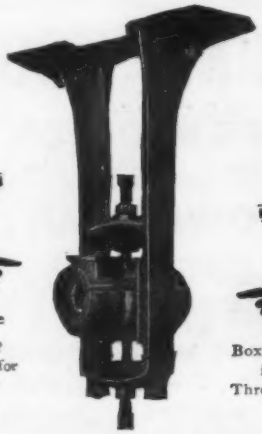

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Box Built in Three Parts.

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SAVES POWER TIME MONEY

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Our Booklet No. 12 is "worth while" the asking.

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OLNEY & WARRIN

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Mill Sewing Machines

No. 9.—Portable Foot-Power Rotary Sewing Machine

It is especially adapted for use in Cotton and Woolen Mills, Bleacheries, Print Works at the Printing Machines, in Dye Works, Cloth Rooms, at the Fulling Mill, Shears, Calendars, Gigs, Drying Machines, etc., or any of the different finishing processes in textile mills.

Manufactured by the

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Out with the hot, stuffy air

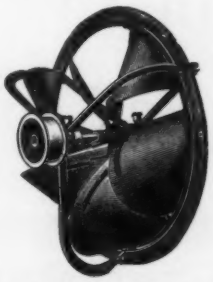
Impure air has an energy-exhausting, nerve-wrecking, output-decreasing effect on your employees. Costs a lot more than

A Berry Wheel

Keep pure air in constant circulation in every room. Lowering the temperature helps to raise the profits.

Very efficient and economical for drying.

This is our Berry Wheel, the most effective agent for moving air, eliminating steam and other impurities in the atmosphere.



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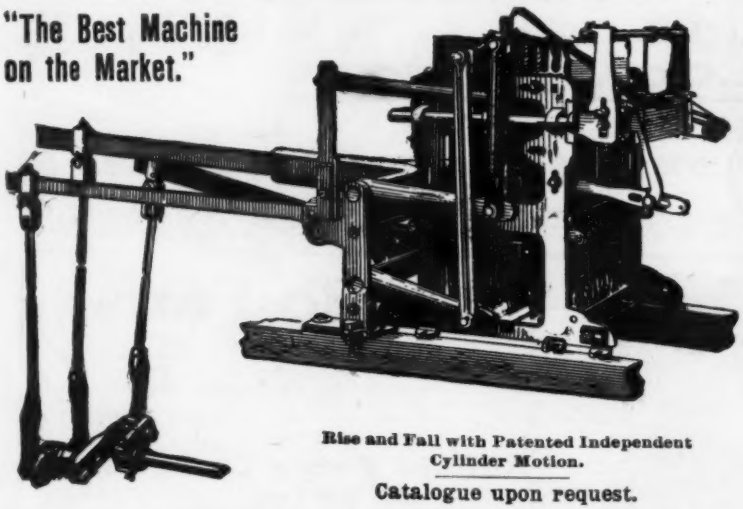

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Catalogue upon request.

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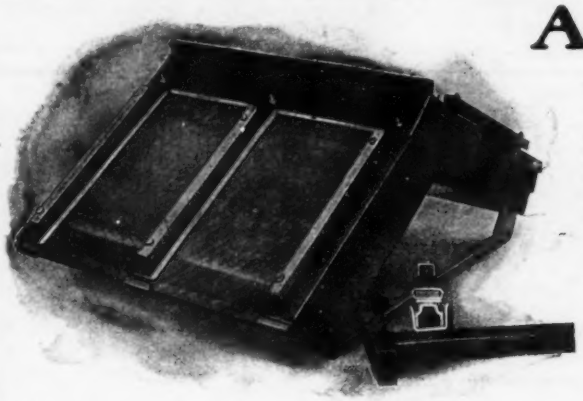

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are easily erected and kept clean. Cost less to maintain than ordinary forms of construction. Anyone can erect. No putty or cement required. Felt rest for glass. Bridge for walking on.

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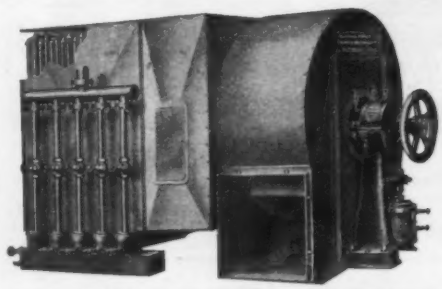

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The Buffalo Fan System affords an unsurpassed means of regulating the temperature, humidity and volume of air, each independent of the other, so that any desired result may be obtained. The Buffalo Fan System presents an ideal method of drying. Gives the most rapid action. Removes the moisture at the lowest temperatures. Is easiest to control. Secures the highest economy. Cost of installation moderate.

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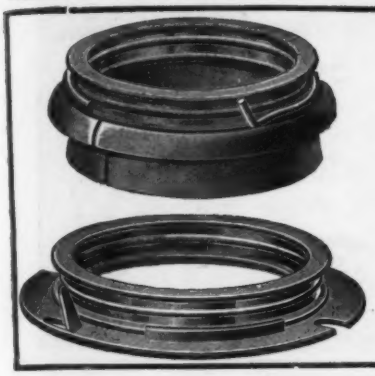

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Precision

is needed above all else in transmitting power to delicate textile machinery. Belts that run straight and true without slipping are absolutely essential and that's why

Gandy Red Stitched Cotton Duck Belts

are displacing all others in this field. The fact that they cost but 1-3 as much as leather belts, and last several times longer, has also contributed to their success. Our free booklet tells more—send for it.

Gandy Belt Dressing maintains the high standard set by Gandy Belts.

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If you are using rope for baling you are helping to pay the gas bill to keep rope prices balloon high.

Rope is up—*Trojan Bale Tie* and *Band* is down.

Trojan Band is made plain or galvanized in coils from 2000 to 3000 feet without a break. Widths ½, ⅝, ¾ and 1 inch.

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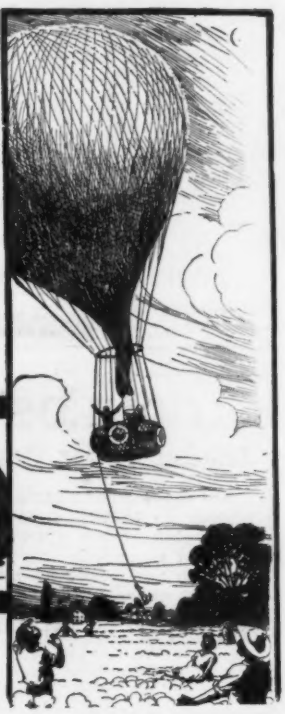

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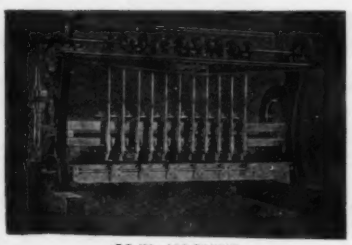

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L. F. FALES

MANUFACTURER AND BUILDER OF

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FOR ALL PURPOSES WHERE A NUMBER OF ROWS OF SEAMS ARE REQUIRED

BUILT WITH ANY REQUIRED NUMBER OF NEEDLES

DESIGNER OF SPECIAL MACHINERY | WALPOLE, MASS. U. S. A. | PAPER SLITTING MACHINES

Established 1870

John Heathcote & Son

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for WOOLENS, WORSTEDS, FELTS, etc.

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Efficient Power Pumps.

are operated at a saving of from 50 to 60% over the actual cost of operating steam pump,—is this not worth while looking into. Write us for catalog.

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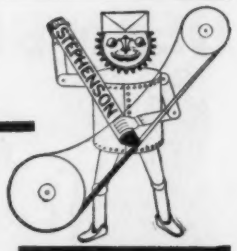

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1⅞ inches in diameter is the size that best suits most men. It has just the right "feel" to it in your hands. ¶ Clean to handle; easy to apply (friction on the belt heats it,) always to be relied upon where a belt slips. STEPHENSON Dressing reflects credit on the maker, the seller and the user. Quality dressing for Quality folks. ¶ Your hardware store will sell you as little as a box of a dozen pound sticks, or give you a free sample to test.

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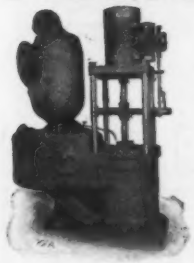

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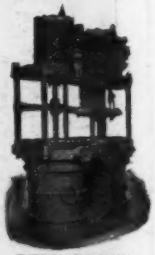

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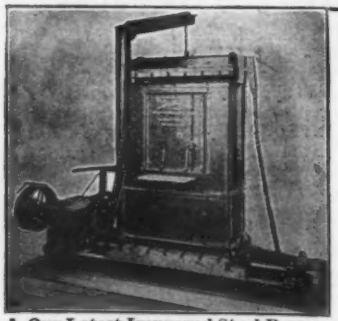

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Minnich Baling Press

for all kinds of products.

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It has no superior. Its only equal another Dixie.

A three string 20 lb. broom, equal to a 24 lb. wound broom $2.00 per doz.
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Lower prices on larger quantities. Prompt shipments.
Send us a trial order. You are under no obligations if they are not entirely satisfactory.

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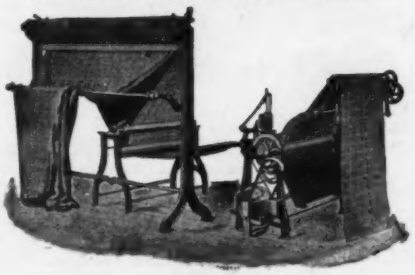

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Made of fine quality spring wire adjusted to the same tension. The plate or follower is made of IXXX tin plate with rounded edges, avoiding all wear on the sides of the can. A half inch hole in the center of the plate prevents suction. The spring for satisfactory service.

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Sews any Fabric

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that shows in Yards the output of each machine.

A glance tells how the machines are running —enables you to keep output up and cost down.

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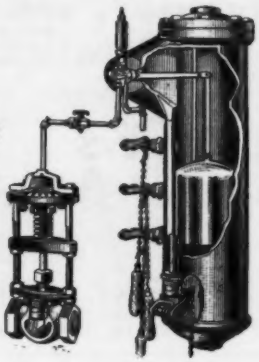

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1866 **1908**

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41st Annual Statement

January 1, 1908

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Surplus, 1,006,868.06
Reserves, 2,053,326.74
Assets, 4,060,194.80

The HARTFORD was the Pioneer Company in the field of Steam Boiler Insurance, and it is the only company which makes a specialty of and does exclusively a steam boiler inspection and insurance business.

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The HARTFORD is now doing nearly nine-tenth of the Inspection and Insurance of Steam Boilers in the New England States, and nearly two-thirds of the entire amount done throughout the United States.

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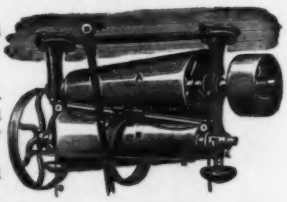
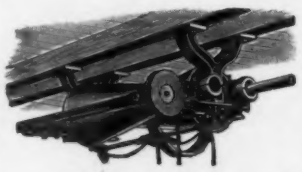
Variable Speed Countershafts

The Evans Friction Cone Pulleys



will drive your machines at any desired speed from 1 to 6 by simply pulling a cord.

They are guaranteed to do your work.



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Over Ten Thousand Sets in Operation in this Country and Europe.

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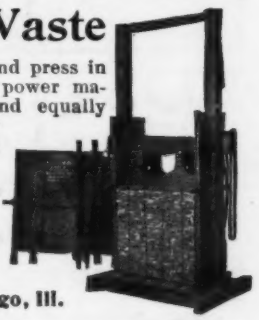
by hand; a Sullivan hand press in much less costly than a power machine, but will be found equally satisfactory for packing cotton and woolen mill waste.

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Sullivan Machinery Company
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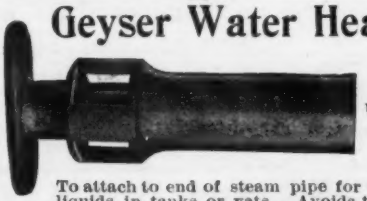
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To attach to end of steam pipe for heating liquids in tanks or vats. Avoids that disagreeable noise caused by the direct introduction of a steam jet and raises the liquid to the required temperature in about 70% of time required by latter.
By its thorough circulation it distributes an even temperature throughout the tank. Price list upon application.
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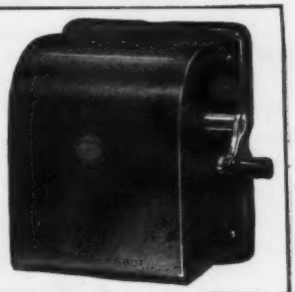

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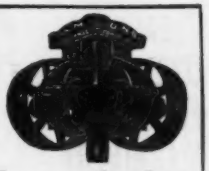

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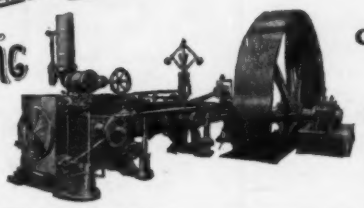

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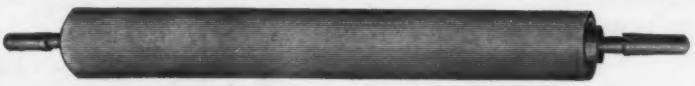

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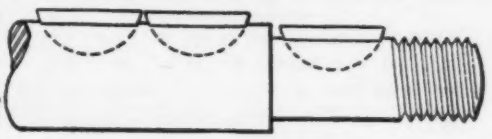

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Full information is given about each mill in almost every instance, viz: the name of the company or firm, names of officers, agent, superintendent, the character of goods made, machinery equipment, i.e., the number of sets of cards (or combs), the number of spindles, number of looms; whether the mill uses steam or water power, whether there is a dyehouse or not, the names of the selling agents or if the mill sells direct, and in many instances the name of the man is given who buys the raw material and supplies. In this section of the Directory, all the mills in one place are arranged under the head of that town, but so designated by boldface letters, that the kind of mill is determined at a glance, so that a person, looking, for instance, only for woolen mills, can pick them out instantly. This system of arrangement is conceded to be the most convenient of any as it groups all the mills in one town together and is self-indexing, while at the same time those interested in a particular class of mills, such as cotton, silk or knit, can find them as easily as if they were classified separately.

The Map Feature was originated by the Textile World in 1894, and is copyrighted. There are 19 of these textile maps, which show only the cities and towns where there are textile establishments. 19 maps.

An Alphabetical Index to the textile establishments in the United States; about 7000.

Mills with Worsted Machinery. A separate list is compiled of mills with worsted machinery for the convenience of those dealing exclusively with that branch.

The Yarn Trade Index. In this department are classified lists of manufacturers of different kinds of yarn who spin for the market. It gives the size of yarn spun and the form in which the yarn is put up, together with the selling agents of the mills, or, if sell direct. About 900 names.

Classified List of Manufacturers. This is a new section in which all the manufacturers of textile fabrics are listed under suitable headings showing the classes of goods made.

The Textile Mills in Mexico. This feature of the American Textile Directory is continued and brought up to date by the latest information. About 300 mills.

Commission and Order Section. In this department are classified lists of establishments doing dyeing, bleaching, printing, finishing and mercerizing on order, sub-divided according to the class of work done. About 500 names.

Raw Material Section. In this department are complete lists of dealers and brokers in wool, cotton, shoddy and extracts, and wholesale rag dealers. About 2200 names.

Selling Agents and Dry Goods Commission Houses in the principal cities of the Unifed States, giving the character of goods handled. About 2300 names.

Textile Associations. Owing to the growing number of inquiries for information of the various associations a list of all the textile associations in the United States and Canada has been included in this year's Directory. The names of assaociations, officers and addresses are given.

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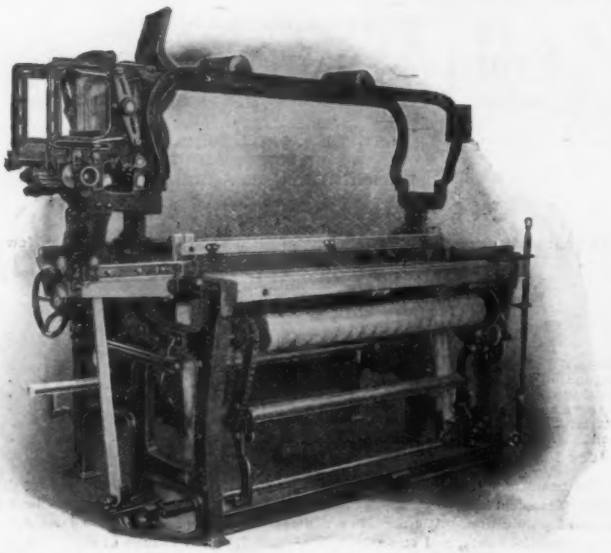

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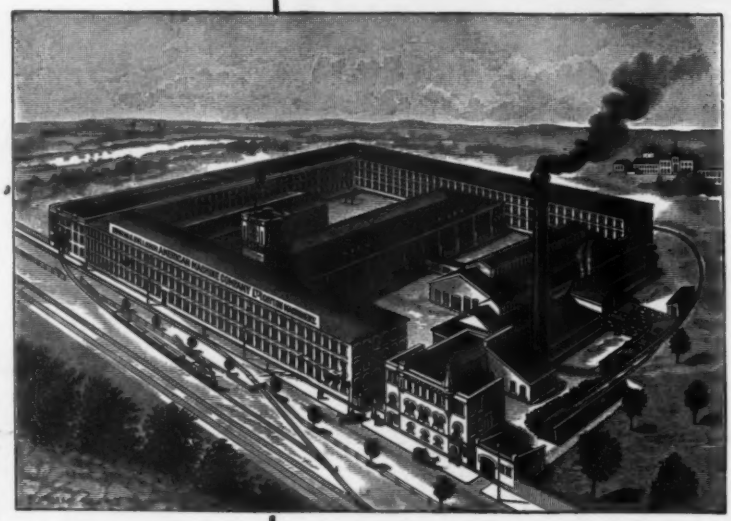

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COMBINING

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VOL. 35 (NEW SERIES.) July, 1908 No. 4

Monthly Comment.

Marketing Wool at Omaha.

The plan to concentrate the marketing of wool at Omaha has already progressed so far that the building of more warehouses is under consideration. The first one is taxed to its full capacity, 5,000,000 pounds, and additional facilities are required to take care of the consignments that are offered. It is the intention to confine the business to the storage of wool, and a holding company, distinct from the warehouse company, has been organized to make advances on the wool. It is believed that in this way the enterprise will prove to be of great advantage to both the seller and buyer by concentrating at one place the wool that is now widely scattered throughout the wool growing sections of the country.

The plan, as outlined by those in charge of it, does not contemplate any effort to sell wool direct to the mills. In fact, the Omaha warehouse and wool handling companies have nothing to do directly with selling the wool to anyone. Their work is to store the wool and make advances to the owners, the latter having control of the selling to any buyer, whether dealer or otherwise. The storehouses are located alongside the railroad, the first one being 300 feet long, 24 feet high, 80 feet wide at one end, and 127 feet wide at the other.

A Million Dollars a Day.

Soon after the German agreement went into effect last year, the Washington administration was forced to extend its privileges to other countries. The agreement must, therefore, be judged by our trade with all foreign countries and not with Germany alone. During the first nine months of its existence the country suffered, as at present, from a severe depression in business, as a result of which our imports of all kinds for that period, ending March, 1908, dropped to $930,846,682, a reduction of $135,998,347, as compared with the corresponding period of the preceding year.

If the imports of textile manufactures had fallen off in the same proportion as the remaining articles we would have imported for the first nine months under the so-called German trade agreement $128,882,176 worth of textile goods. As a matter of fact the textile goods imported during that period amounted to $146,237,611. Allowing 50 per cent. for the increase in value brings the domestic valuation of the textile goods bought abroad during that period up to $219,356,416, which is at the rate of nearly a million dollars a day, to be exact, $953,723.

At the 1905 rate of production the manufacture of these goods would have kept 177,637 operatives employed in textile mills

alone. Accepting the estimate of 1 to 7, the manufacture of this $219,356,416 worth of textile goods would have supported directly and indirectly a population of 1,243,459. While we have been buying this vast quantity of goods from foreign manufacturers a large proportion of the textile operatives in this country have been out of employment, while those employed have had their wages reduced. The natural expectation is that Congress and the administration responsible for the German agreement would address themselves promptly and vigorously to investigating the causes and applying the remedy for such a remarkable disarrangement of trade and industry. Instead of that, however, the public discussion of the question has been carefully suppressed in both branches of Congress, while the administration has shown no disposition to retrace its steps and afford relief to the textile industry. The party out of power has done nothing because its members think they favor a reduction of the tariff. The party in power has done nothing for fear the resulting agitation would injure the party prospects next November.

The Fire Risk of Shoddy.

We give in this issue an account of tests made by an Austrian chemist to determine the fire risk of shoddy as compared with wool and cotton. This is an important field for investigation and it is to be regretted that the Austrian experiments were not made on a larger scale. In reading the report of these tests it is difficult to avoid the impression that the chemist was desirous of reaching the conclusions he did finally reach. The results necessarily fall far short of being conclusive when based on tests of but a few samples of shoddy and olein, all furnished by one shoddy manufacturer. The Austrian chemist's assumption that it is unprofitable for shoddy manufacturers to put oil on their stock is clearly wrong when applied to many kinds of shoddy and oil used in the United States. We hope that a broader investigation of this question will be made. Why does it not offer a good opportunity to our textile schools to render a service to the trade?

Wool Production and Consumption.

In view of the agitation over the methods of marketing wool the figures showing where the wool we use is grown and where consumed by the mills are of especial interest. According to the U. S. census of 1905 there was consumed in the United States in the census year 500,826,711 pounds of wool, both domestic and foreign. The domestic wool clip is believed to be about 300,000,000 pounds. Accepting the census figures of consumption and the National Association of Wool Manufacturers' estimate of production, we have the following statement of the wool produced and consumed in various sections of the United States:

	Wool, Lbs. Grown.
New England	3,193,000
Middle States	11,012,000
Southern States	36,210,750
Western States	173,291,500
Pacific States	32,587,500
Total	256,294,750

	Wool, Lbs. Consumed.
New England	268,452,021
Middle States	194,960,389
Southern States	5,881,577
Western States	27,332,609
Pacific States	4,200,115
Total	500,826,711

The amount of pulled wool is estimated at 42,000,000 pounds, bringing the total clip for 1900 to 298,294,750 pounds. The deficiency between the domestic clip and the consumption is made up by foreign wool. According to these estimates nearly 93 per cent. of all the wool used in the United States is consumed by mills located in New England and the Middle States. The figures given are based on the grease weight of the wool. On this basis 40 per cent. of the wool used is imported. If the clean weight is taken the proportions will be reversed owing to the lighter shrinkage of the imported wools, 60

per cent. of the scoured weight coming from abroad. Under these conditions the leading market for wool in the United States must remain in the East where it is now.

Egyptian Ginneries.

According to H. N. Brailsford, of London, Eng., the conditions of employment in Egyptian cotton ginneries call loudly for reform. In a letter to the "Manchester Guardian" he tells of what he found on a recent visit to Egypt:

At Zagazig I visited a ginnery, and questioned (there and at Mansourah) several proprietors of mills, managers, engineers, and a local doctor. The mills depend for their unskilled work mainly on seasonal migrants from the poorer districts of Upper Egypt. The labor is casual, and of course unorganized. Three children, in rough numbers, are employed for every adult, and they range in age from nine to fifteen years. The mill starts at 6 a. m., and the workers leave it at Zagazig (as I saw for myself) at 9 p. m., and in some other towns (as I was informed) at 10 p. m. There is rarely a dinner hour; the children are allowed an odd half-hour to eat their meal of maize-bread and onions amid the dust of the mill.

The work is easy, and demands neither skill nor strength; but, protracted as it is for fifteen or sixteen hours, it must involve an unconscionable strain on the endurance of growing boys and girls, not to speak of the women. At the height of the season the mills work day and night, and the children, like the adults, are put on a night shift of twelve hours.

The conditions for health could hardly be worse. Especially when a low-grade cotton is being treated, the air is a mere fog of cotton dust. No device save a broom is used to cope with this dust, which whitens the black hair of the children and must undoubtedly penetrate to their lungs.

The method of maintaining discipline is that which has been traditional in Egypt since the days of the Pharaohs. I saw an overseer strike a child with a cane, and another brandished in my presence a rather formidable whip.

The wages are lower than those of day laborers in the fields: they average for unskilled adults four piastres daily, and for children 2 1/2 piastres (12 cents). To judge of these wages it is necessary to remember that for an adult fellah the cost of a day's food at present prices is about 2 1/2 piastres (12 cents), if I may trust the figures given in a recent discussion at the Egyptian Institute in Cairo. Even these wages are not always received. Fraudulent or capricious deductions have been so common that in some mills the adult workers now insist on receiving their wages in advance as they enter the mill, leaving some garment with the porter as a pledge.

I could obtain no direct evidence as to the effects on health of the excessive hours—there is no Governmental medical inspection and no municipal medical poor relief. But an observant official informed me that he had noted among the adult workers (who are nearly all Mahometans) a tendency to violent drinking-bouts. He compared their case with that of overworked stokers in the Red Sea. A local doctor expressed the opinion that the children are often forced by poor or idle parents to work against their will; he had treated a boy who had been burned with hot irons by his step-father to force him to work.

I have stated the facts baldly as I found them. I will now recite the considerations urged in mitigation of my censures by a certain British official. He said (1) that the workers are contented, to which the answer is that there was a strike last season in the ginneries at Mansourah—a fact of which he was ignorant. He thought (2) that in the Egyptian climate long hours are not a hardship. But the dust-laden atmosphere of the mills is not the climate in which he makes work tolerable with the aid of golf and polo. He urged (3) that the workers are free to work or not to work, as they please—a consideration which ignores the abysmal poverty of the landless peasants, and in any event does not apply to the children. Finally, (4) he reminded me that the season lasted only for four or five months—a circumstance which explains why anyone survives such conditions but certainly does not excuse them.

A difficulty in regulating employment in the cotton ginneries of Egypt arises from the fact that legislation affecting foreigners must receive the assent of all the European powers. The ginneries belong to foreigners and the assent of European nations to regulating legislation is considered hopeless. Other means, however, are available, such as a system of licenses of ginneries conditioned on the acceptance of regulations for employment. Egyptian opinion on the subject is indicated by the following extract from Mr. Brailsford's letter:

In talking over this question with Egyptians I more than once heard this cynical commentary: "You see how the British Government regards Egypt. We are simply a market garden for Lancashire. It will never legislate for the ginning mills. That might raise the price of cotton. Manchester would soon cry out if it did." I always replied that Manchester, on the contrary, would be the first to demand humane conditions.

It is in the hope that this letter may attract the notice of some representative of Lancashire in the Commons, of some influential member of a Chamber of Commerce, or of some trade union leader that I venture to ask you for space and publicity. A request from Manchester to the Foreign Office would probably suffice to make life tolerable for the thousands of Egyptian children whose health and happiness are sacrificed at present to prepare the raw material of Lancashire's prosperity.

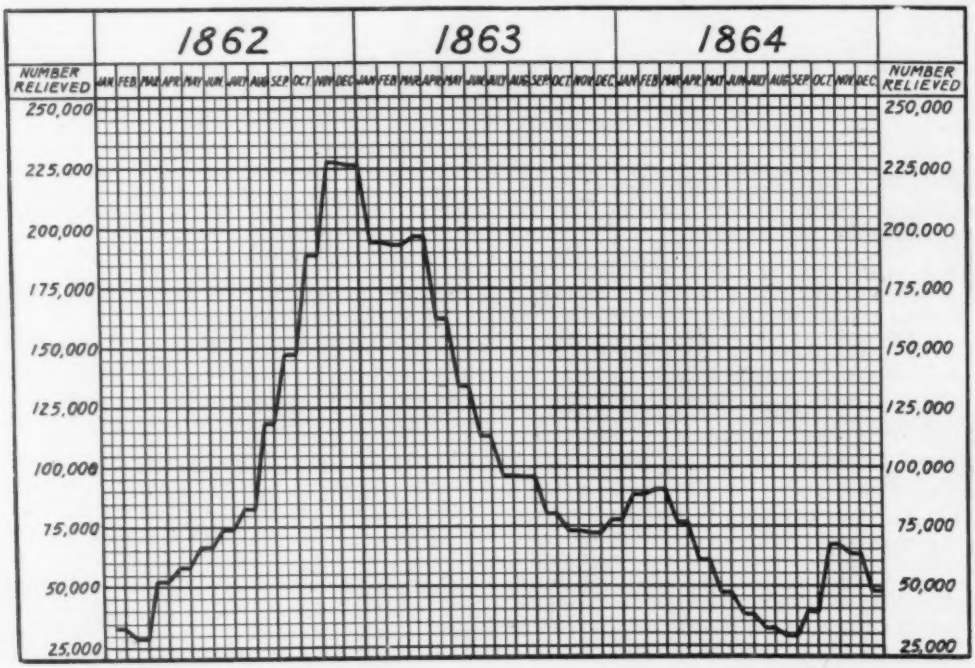
Europe and the American Cotton Supply.

THE MAIN OBJECT.

The fifth congress of the International Cotton Federation was held last month at Paris. Among the 450 delegates in attendance were representatives from Japan, Peru and the United States, as well as the various countries of Europe. There was a reception by President Fallieres and the usual number of perfunctory addresses. The main feature of the Paris Congress was the adoption of the following short time resolution:

Resolved, That whenever there is a lack of raw material, or when the manufactured articles exceed the demand in any country, the adoption of short time running of mills is the only real remedy; and that all associations be requested to perfect their local organizations in order to put short time into operation whenever it may be considered necessary.'

This resolution is a frank admission of the main object of the International Cotton Federation. That object has been evident from the first inception of the Federation, which was brought into being by the shortage of cotton in 1904 and the consequent necessity for cotton-spinners to run on short time. The usefulness of the Federation in this and other directions has for three years been somewhat impaired by an effort to keep the main object of the organization in the background. It is to be congratulated on the Paris short time resolution because that object, restricting the consumption of cotton to meet the exigencies of the markets for raw cotton and manufactured goods, is altogether proper and right.



THE COTTON FAMINE IN LANCASHIRE. FLUCTUATIONS IN THE NUMBER OF PERSONS RELIEVED BY PUBLIC CHARITY IN ASHTON-UNDER-LYNE, BLACKBURN, OLDHAM, PRESTON, ROCHDALE AND STOCKPORT.

A VAST INDUSTRY DEPENDING ON FOREIGN COUNTRIES.

When the situation in the European cotton industry is considered there is no occasion for surprise that the congresses of the International Federation are occupied so completely by discussions of the cotton supply. The European industry, operating 90,000,000

spindles and affording a means of subsistence for many millions of people, estimated at 10,000,000 in Great Britain alone, is wholly dependent on foreign countries for its supply of raw material. One of the specters always stalking before the spinners, manufacturers and rulers of Europe is an interruption in the supply of cotton. The French Minister of Commerce and Industry, M. Cruppi, in his address to the Paris Congress, gave this expression of his deep concern regarding the cotton supply:

> The question of obtaining an adequate supply has, because of its importance, become a veritable social question, which should engage the attention not only of manufacturers, but of all the governments."

A DANGEROUS SITUATION.

The rulers and thinking men of Europe are laboring under no illusions. They know that stopping the supply of American cotton would mean anarchy in nearly every country of Europe. They have an illustration of its effects during the civil war. Throughout that period of distress there was a remarkable absence of rioting and public disturbance. The working people passed through the terrible ordeal with a law-abiding patience that will ever command the admiration of the world. But such patient endurance cannot be counted upon if a cotton famine should occur again. Many more people would be involved, not only in Lancashire, but on the Continent, and nothing seems more certain than that depriving Europe of cotton would shake the European social system to its foundations.

THE LESSON OF 1861-65.

The extent of the calamity caused in Lancashire by stopping the supply of American cotton, and the rapidity with which the one followed the other are illustrated by the accompanying chart, compiled from "The Facts of the Cotton Famine," by John Watts, 1866, which shows the fluctuations in the number of persons relieved by public charity in Ashton-under-Lyne, Preston, Blackburn, Stockport, Oldham and Rochdale in 1862, 1863 and 1864. These six districts, with a population of 662,000 in 1861, had 227,600 persons, or over a third of the inhabitants, supported by public charity in November, 1862. Similar conditions prevailed throughout all Lancashire, which then had a population of 2,500,000, engaged principally in the cotton industry. Of the people who escaped public charity, many emigrated, while those that remained endured the extremes of privation and distress.

INCIDENTS OF THE FAMINE.

Impressive as are the chart and figures we have presented, it is the statements by those who visited the poor of Lancashire that bring home to us most forcibly the conditions during those dreadful years. Here is an incident of the famine related by the special correspondent of the "Manchester Examiner":

> A visitor called upon a destitute family and found the man sitting alone, pale and silent. His wife had been "brought to bed" three days before, and the visitor inquired how she was getting on. "Hoo's very ill," said the husband. "And the child, how is it?" said the visitor. "It's deed," replied the man; "it deed yesterday." He then rose and walked slowly into the next room, and returned with a basket in his hand, in which the child was decently laid out. "That's o' that's laft on it neaw," said the poor fellow. Then putting the basket on the floor, he sat down with his head between his hands, looking silently at the corpse.

And here is another case reported by the same eye witness:

> A visitor called upon a family where no application for relief had been made, but some of the neighbors had said they were "ill off." The visitor finding them perishing for want, offered some relief tickets, but the poor woman began to cry, and said: "Eh! aw dar not touch 'em; my husban' would sauce me so! Aw dar not tak 'em; aw should never yer th' last on't." In a dirty pent up corner of a dark and damp entry, a low door stood open; it led into a low, gloomy-looking hovel, not more than three yards square, and without fire in the grate. No sunshine could ever reach there, nor any fresh breezes disturb the pestilent vapors that were festering in the sluggish gloom. In one corner, a little worn and broken stair led to a room of the same size above, where there was some straw for the family to sleep upon. The furniture consisted of two rickety chairs and a broken deal table, reared against the stairs because one leg was gone. A quiet looking, thin woman, of fifty years of age, sat there. She had buried five children and had now six living with her in that poor place. They had no work and no income whatever, except from the relief committee. The poor widow pointed to the cold corner where her husband had lately died. She said "he had been oot o' wark a long time afore he deed."

We could extend indefinitely similar illustrations of the terrible situation in Lan-

cashire in 1861-65, which was summarized in the following words by Mr. Cobden, M. P., in his appeal to the public for relief funds:

All this brings me to this conclusion: that something more must be done by this general committee than has been done to awaken the attention of the public generally to the condition of this part of the country. It is totally exceptional. The state of things has no parallel in all history. It is impossible you could point out to me another case, in which, in a limited sphere, such as we have in Lancashire, and in the course of a few months, there has been a cessation of employment at the rate of £7,000,000 sterling per annum in wages. There has been nothing like it in the history of the world for its suddenness, for the impossibility of dealing with it, or managing it in the way of an effective remedy.

EUROPE'S DEPENDENCE ON AMERICA.

The effect of the cotton famine during the civil war is of direct application to present day conditions because the half century since then has increased Europe's dependence on the American cotton belt nearly three-fold, our exports of cotton having grown from 3,127,000 bales in 1861 to 8,364,000 bales in 1907. The bulk of this cotton is wanted in Europe not for clothing the people, but that it may be manufactured into goods to be re-exported, and thus provide profits for employers and employment for millions of mill operatives in a cotton industry of 90,000,000 spindles and in the allied trades. For the working people American cotton is food, fuel, clothing, shelter, life itself. To stop cotton going into Europe or to stop goods made of American cotton from coming out of Europe means famine and social chaos in England and on the Continent on a scale vastly greater than that of 1861 to 1865.

SHORT TIME.

Under these conditions it is not surprising that the cotton supply should engage the most earnest attention not only of the cotton spinners and manufacturers, but of all the rulers of Europe. The means adopted for meeting the danger have included short time, growing cotton outside of the United States, and promoting an increase of the American crop. Short time we need not discuss here. It is a manufacturer's makeshift and not a cure for the trouble. It is the famine itself.

COLONIAL COTTON.

Growing cotton outside of the United States goes to the root of the difficulty, but all the available evidence indicates that the additional cotton obtained in this way will not be more than a bagatelle compared with the increase in the demand for cotton throughout the world. Here for example is the statement made at Paris last month by Henry Higson, of England, in his report on the work of the British Cotton Growing Association:

The total production of cotton under the auspices of the Association has increased from less than 2,000 bales in 1903 to 26,000 bales in 1907, and has reached a total value of £400,000.

A DROP IN THE OCEAN.

After all the efforts put forth to raise colonial cotton, including the guarantee of a minimum price to the growers, free distribution of seed, subsidizing railroads, free transport by steamship lines, and other hothouse methods, the British Cotton Growing Association can point to an increase of only 24,000 bales in the cotton supply in four years. The insignificance of this result cannot be made plainer than by recalling the following moderate statement by J. A. Hutton, of the British Cotton Growing Association:

The population of the world increases annually, and needs at least 400,000 bales of cotton more each year to meet its requirements.

FREE TRADE IN COTTON.

The vigor with which colonial cotton growing is exploited in Europe results from a narrow national prejudice that sees some inherent superiority in cotton grown and manufactured under the same flag, blind to the fact that cotton grown in the United States or in Africa in each case offers the same advantage to spinners in all parts of the world. The forcible stoppage of the exports of American cotton to Europe is no longer within the field of reasonable speculation. It could be brought about only by an alliance of European nations, and their vital interests would prompt them to unite to keep the stream of American cotton in motion. Europeans know this, but their delusion is now taking the form of a fear of what Europe will do when all the American crop

is used in the United States. The following is from the Paris report of M. Lavoisier, a French delegate to the Atlanta Congress:

> Mr. North, Director of the United States Census, said:
>
> "I look forward with confidence to a future when the United States instead of exporting the two-thirds of the crop, will work up the greater part of it at home, thus realizing for our own country the enormous profits which accrue from the treatment of this textile."
>
> And also the following statement by Gov. Blanchard, of Louisiana:
>
> "We know that Germany and England are trying to grow cotton in their colonies; but we believe that they are trying to plant it where God never intended it should grow."

Pondering on these two propositions the "Textile Mercury" of Manchester exclaims:

> Put the two statements together—"God intended that cotton should be grown only in America," and "We intend to use the greater part of it." What, then, is the destiny of the rest of the cotton-spinning world—who perhaps may be allowed to suppose themselves likewise to be God's children?

The trade in raw cotton is now free to all the world. Cotton belongs to the buyer who will pay the most for it. If "the rest of the cotton spinning world" want American cotton, they can get it by bidding early enough and high enough. Likewise Indian, Egyptian and colonial cotton belongs to the buyer who will pay the most for it. If American spinners want the cotton grown outside of the United States, they can get it by bidding early enough and high enough. Cotton, no matter where grown, whether in the American cotton belt, in Africa or Turkestan, in the valley of the Ganges or on the banks of the Nile, forms one store from which spinners can supply their wants free from arbitrary restrictions. The cotton supply is like an ocean in which all streams find a common level. Distance is not a factor in the problem. Measured by the cost of transportation Texas is as near to Lancashire as to Massachusetts. To the human being in want of cotton it makes no difference where on earth it grows.

THE ONLY WAY.

With free trade in cotton assured and with an arbitrary interruption of or interference with American cotton exports out of the question Europe should address itself to the simple problem of raising cotton where the required quality and quantity can be produced at the lowest cost. To do otherwise, to waste valuable time trying to raise cotton under adverse African conditions, while neglecting favorable conditions in America is to invite a disaster to Europe in time of peace like that caused by war in 1861. Then war caused the cotton famine, but under the conditions which the present fatuous course of the European Cotton Federation invites, a cotton famine may cause the worst of wars, a civil conflict, of which last year's wine riots in the South of France is a faint illustration. Imagination may faintly picture, but words cannot express the feelings of those who at such a time might recall that in 1908, in spite of plain warnings of the danger, a Cotton Congress at Paris neglected the vast undeveloped resources of the American cotton belt and sought the vitally necessary increase of the cotton supply in Cameroon, Dahomey, Eritrea, India, Indo-China, Lagos, Nigeria, Nyassaland, Senegal, Sierra Leone, Soudan, Togo and Uganda.

EUROPE HAS THE REMEDY AT HAND.

The path of wisdom has been repeatedly pointed out to the European Cotton Federation since its birth at Zurich in 1904. When just a year old, in 1905, it listened to the following advice from the American delegate to its Manchester Congress:

> Labor is scarce in the South, but plentiful in Europe. The population of the entire cotton belt is but 15,000,000, which is less than that of Switzerland, Holland and Belgium. The great need of the South is more people. A million emigrants a year are leaving Europe for the United States, and yet not five thousand of them reach the South where labor is needed to supply Europe with cotton. They crowd into the already over-crowded cities of the North, when they might become prosperous and independent planters in the South. The bare statement of this condition points to the solution of the cotton problem. When the cotton spindles do not supply the looms you build more spinning mills. When the cotton fields do not supply the spindles the remedy lies in sending your surplus labor into the fields to raise cotton.

It has heard the same advice from many sources since then. It has sent delegates to America to learn for themselves. At Paris last month it again had the nearest way pointed out by D. A. Tompkins, of Charlotte, N. C.:

Here is a country having ample spare land; having the best climate for cotton production which is known in the world; having the best fertilizer system already developed; having all the tools and implements necessary for the production of cotton and its preparation for the market; having a large population saturated with the knowledge and skill necessary for cotton production and its preparation for the market. A new population could go at once into the production of cotton without waiting for experiments. Therefore, if the European consumer would use his influence to turn the tide of emigration from Europe to the cotton states of America, he would do the cotton trade more good than in any other way.

THE WORKERS HAVE MOST AT STAKE.

The leadership in enlarging the cotton supply naturally falls on the employers of Europe. The resulting prominence they attain should not obscure the fact that it is the cotton mill employes, not the employers, who have most at stake. In 1905 there were Lancashire spinners and manufacturers who boasted that having charged off the entire cost of their plants and accumulated and invested a large surplus, they could shut down their mills and continue indefinitely to pay a good dividend on the shares. The prosperous times since 1905 have undoubtedly increased the number in that fortunate position. At the worst, however, a cotton famine means only a loss of property to the employer. All are sure of a living. The workers occupy a different position. Their small savings soon melt away. Deprived of the opportunity to work they have the choice of perishing or living on the charity of others more fortunate.

A HEAVY RESPONSIBILITY.

The members of the European Cotton Federation should keep these well-known facts in mind. Their financial resources, their position and influence in the business and social worlds, the glamor of cotton congresses, the bowing and scraping along the Quai d'Orsay and on the Imperial yacht at Kiel, their reception by the most exalted personages and the flattery whispered in their ears that they are promoting the peace of the world, should not blind them to the heavy obligation they owe to the toiling millions of Europe to discard all other considerations and take the nearest way to an increase of the world's cotton crop.

IN SELF DEFENSE.

If, however, the employers continue to neglect their plain duty, then those who have the most at stake, the workers of Europe, should in self-defence take the matter into their own hands and adopt the only means that promises to protect them against a cotton famine, namely, diverting the stream of European emigration to the American cotton belt. In this way the cotton crop will be increased, the emigrants will be benefited, the situation of the workers left in Europe will be improved and the danger of immigration into the Northern States in excess of the ability to assimilate the new comers will be avoided. This would be distributing population for the greatest individual and collective advantage of mankind. It would be equalizing the division of labor. It is reason and common sense.

Must the cotton trade of Europe be brought to the valley of the shadow of death before this lesson is learned?

The exports from Switzerland to the United States for the first six months of 1907 amounted to over 14 millions of dollars. Of this amount about 7 millions of dollars was for the single item of embroideries from the district of St. Gall.

For the 9 months ending March, 1908, the cotton goods imported into the United States were valued at $58,584,738. This was the first 9 months under the German agreement and the imports of cotton goods showed an increase compared with the imports for the corresponding 9 months of 1907, which were valued at $56,395,630.

For the 9 months ending March, 1908, the imports of silk goods into the United States were valued at $28,094,161. Of this quantity France supplied the largest share which was valued at $12,369,115. Germany came next with $6,266,172. In view of the German agreement which was in force during these 9 months it is significant that in spite of the business depression Germany's share showed a material increase over 1907 when the German silks imported into this country during the corresponding 9 months were valued at $5,757,963.

Seasonable Fabrics.

DRESS GOODS.

The booking of fall orders of dress goods has not been as large this season as in former years. The falling off in this branch of the trade is due largely to the conservative buying during the early part of the season. While most of the buyers have placed orders for part of their business, they feel inclined to hold back the balance, with two objects in view. First, to be prepared for new developments; second, they prefer to keep their stocks down as low as possible so that they

FIG. 1.

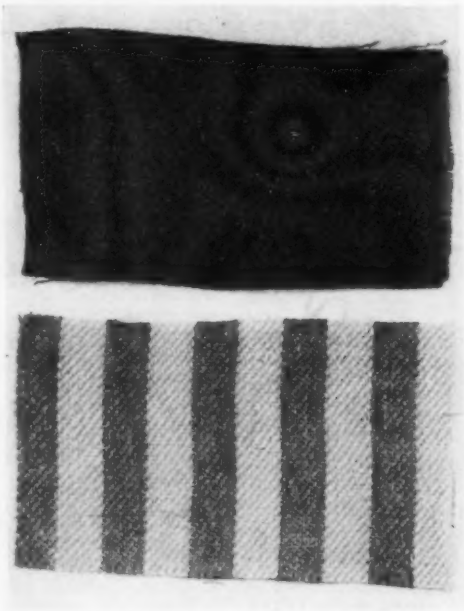


FIG. 2.

may be in a position to take in special lots that are offered during the fall season at reduced prices.

Broadcloths continue to be the most desirable fabric for fall. The cutting-up trade has already placed a great many orders for these goods for street and general wear.

Fancy weaves are receiving considerable attention. These goods are being made in some very attractive designs. Piece-dyed materials are being favored very much in fancy, cheveron and diagonal stripes. Fig. 1 shows a diagonal sold by Wm. Issaac at 85 cents a yard, 54 inches wide. Fig. 2 shows a Pekin stripe from Boessneck & Broesel at 62 1/2 cents a yard, 54 inches wide.

There has been a steady demand for hair-line stripes. Fig. 3 shows a hair-line stripe from King & Beals at 62 1/2 cents a yard, 54 inches. Fig. 4 shows a light weight striped panama from Keene & Revel at 70 cents a yard, 42 inches wide.

Rough faced materials such as unfinished

FIG. 3.

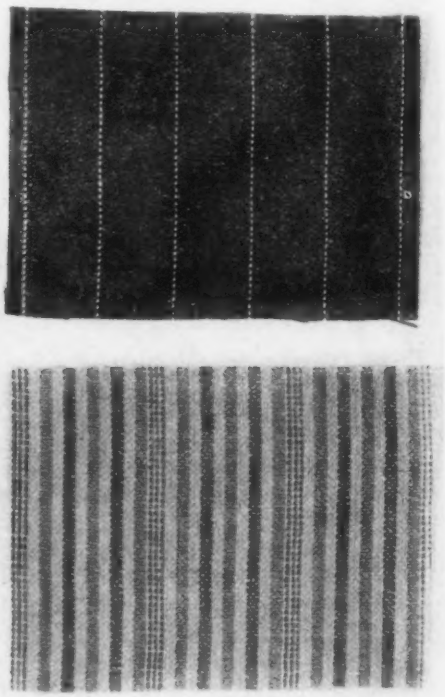


FIG. 4.

worsteds in piece dyed and fancy weaves are in good demand.

The demand for panamas, voiles, etc., in the staple colors promises to be good during the coming season.

SILKS.

With steadier prices prevailing in the raw silk market, the number of orders for fall deliveries has shown a slight improvement. Buyers are placing their orders more freely, and they feel confident that prices will not be any lower than the present quotations. The manufacturers are gratified with the business they have already booked, and look forward for a steady increase.

Plain colored taffetas are very strong for fall. These goods have been reduced about 25 per cent. since last season. At the present time some of the mills are sold up on their earlier shipment and are taking orders only for September and October deliveries. Copenhagens, tans, browns and navies are the most desirable colors.

While the demand for black taffetas has not been as large as in former seasons the manufacturers predict that there will be a scarcity of these goods later in the season as the mills are not making up any surplus stocks.

Fancy weaves are receiving considerable attention for the coming season, especially in the cheveron and herring-bone stripes. The trade has taken to these goods in all grades from 45 cents up. Fig. 5 shows a 19-inch cloth made by Givernaud Bros. at 45 cents a yard, which has sold very well, especially for linings. Fig. 6 is a very attractive style made by Valentine & Bentley at 72 1/2 cents a yard, 20 inches wide. It is being extensively used for waists and gowns.

Soft silks are gaining favor both in plain colors and fancies. The demand for messalines, satins, etc., has been very good for the coming season. The demand this season has favored light weight materials more than ever.

COTTONS.

The cotton goods market has shown quite an improvement in the past 30 days, while prices on 4/4 bleached and brown cottons have advanced from one-quarter to one-half a cent a yard. Orders are being received for larger quantities of this merchandise, and in some instances the popular brands are scarce. The manufacturers are well satisfied with the business they are doing, and predict that with the activity continued it will be but a short time when the market will be in a normal condition.

The demand for wide sheetings continues, although these goods have had a slight advance. Sheets and pillow cases are being sold for immediate and fall shipments, as the buyers realize that these goods will not be any cheaper later on in the season.

Staple ginghams are selling very freely.

FIG. 5.

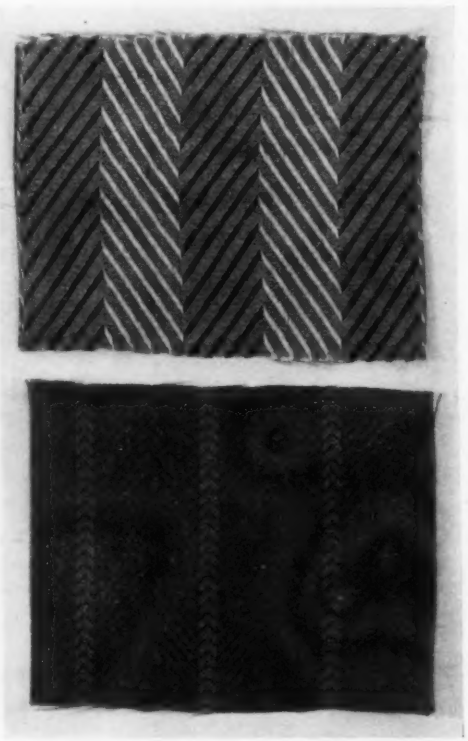


FIG. 6.

The manufacturers are holding them at value, but the jobbers are still offering them at 5 1/4 cents a yard.

The trade has taken well to dress ginghams at the reduced prices. Orders are being received for large quantities of these goods from all sections of the country.

The wash goods business has been good on midsummer fabrics, such as printed lawns, batiste, organdies, etc. Most of this

class of merchandise is being offered in lots at reduced prices, as sellers realize that they must unload this month or carry their stocks over to next season.

The situation on prints, percales and madras remains unchanged. These goods are down to their lowest quotations and the trade have been buying very freely.

The converters report a healthy business on the different lines. The booking of orders for fall has been very satisfactory. Mercerized sateens will be popular during the coming season.

The white goods market shows a slight improvement. While prices are very low in this branch of the trade, it is predicted that further reductions will be made before the coming season opens, and that goods will be offered cheaper than for some time past.

Fall trade on blankets and outing flannels has not been as large this season as in former years, but the manufacturers feel confident that conditions will improve as the season progresses.

Staple household goods, such as bed spreads and towelings, have undergone several reductions. At the new prices business has been very active. Some of the mills are receiving very large orders and are selling up their production on staple numbers.

WASHINGTON NOTES.

By Our Special Correspondent.

An important branch of cotton work, in which the Bureau of Plant Industry of the U. S. Dept. of Agriculture has been engaged, has been the distribution of specially selected and tested varieties of upland cotton, with a view to their adaptation to soil and climatic conditions. This will tend towards a general improvement of the crop, as there can be no doubt that many farmers are growing varieties which are not as well adapted to their particular conditions as other available varieties.

New and little-known varieties, which have proved valuable in certain localities, form the basis of the seed distribution, in order to insure the proper testing of such varieties throughout the cotton states. The sterling qualities of a particular variety must be, however, demonstrated to the representatives of the department having the matter in charge before it can be chosen. A number of new varieties have been greatly improved by hybridization and selection, and it is believed that new strains which have been developed as a result of the work will become valuable. Some of these were included in the distribution of the present year.

* * *

In a variety test made by Prof. Duggar of the Alabama Agricultural Experiment Station in 1904, where 38 of the standard varieties were grown, the yields ranged from 378 to 628 pounds of lint cotton per acre. In a similar test made by the department a year later at McColl, S. C., where 36 of the standard varieties were grown under as nearly uniform conditions as it seems possible to obtain, the yields ranged from 1,575 to 2,850 pounds of seed cotton per acre. These figures strikingly demonstrate how important it is for growers to plant those varieties which have been proved best adapted to the particular conditions of each locality. The growers themselves should test the varieties they plant, putting in small plots of each variety, and carefully noting results.

* * *

There is no doubt that much of the low grade cotton grown is the result of the carelessness and indifference of the growers themselves in the matter of seed selection for the next year's crop. No attention is paid to the character of the stalks from which their planting seed comes. Everything in the field, good and bad, is picked together, and as there are likely to be more poor plants than good, a major part of the seed will produce inferior plants from the next season's planting. If such a practice is carried on from year to year even a good variety will degenerate in a few years.

In order to determine the comparative value of the different varieties of cotton in the various cotton growing states, the recipients of seed in the present year's distribution were requested to give it a thorough trial, in comparison with the varieties ordinarily grown, and be prepared to report the

results of the tests to the department in the autumn. These individual reports will form the basis of a special report or bulletin to be issued later.

* * *

Since my remarks on cotton grading were penned—which appeared in the June number—the second and third parts of the summary of the Cotton Exchange report of Commissioner of Corporations has appeared, the former dealing with classification, and the latter with range of grades deliverable on contract.

Referring to the report we learn that for the purpose of delivery on future contracts, in establishing the 18 grades recognized, the classification is based chiefly on color and amount of trash and dirt in the cotton. Many criticisms have been made on the rules of classification in both the New York and New Orleans Exchanges—the only markets doing a "future" business—as well as the manner in which the rules are applied. We are told of difficulties, and that the classification of cotton will never be an exact science, but must always depend more or less upon the discretion of experts, and be open to honest differences of opinion. There are no uniform standards of grades in the cotton trade. Grades of the same name in different exchanges differ considerably in quality.

The most commonsense conclusion to be deduced from the above statements is that—while such methods of grading cotton may be "satisfactory" for purposes of speculation—for the legitimate buying and selling of cotton, as between the grower and the spinner, the sooner a system of grading is devised, based upon scientific principles, the better for all concerned. No such loose methods or guess work prevail in flax grading, certain standards being recognized, and there should be a nationalized system of standards for cotton, with a classification that would be recognized not only in our own country, but in the other countries which buy American cotton.

The absurdity of the present system, where "grades of the same name in different exchanges differ in quality," is on a par with the absurdity of permitting interested bodies of mere speculators to have anything to do with so important a matter. As intimated in my former remarks, here is work for the U. S. Bureau of Standards, and as far as exchange methods are concerned, "reform it altogether."

Renouard.

CONDITIONS IN RUSSIAN MILLS.

BY EDWARD ELSNER.

During the past few years the textile mills of Russia have been storm centres for political agitation. Murders have been frequent and a veritabe reign of terror has taken place. The principal textile district in Russia is Lodz, a city of 400,000 inhabitants, in Russian Poland. The greater part of the population are employed in the mills. Before the Russian-Japanese war the conditions in Lodz were not especially good, judged by European standards. The working time was 11 1/2 hours per day. The wages equal to about the average prevailing in other European textile districts. Strikes were rare, as the government looked upon these as largely political movements, and consequently suppressed them with great severity. Then came the revolution, and with it the first strike of political origin and which had in a large degree the sympathy of the manufacturers themselves. The strikers succeeded, without difficulty, in obtaining what they demanded. This was the beginning of a state of anarchy in which all discipline in the mills disappeared. In their demands for higher wages and shorter working time the operatives deserved sympathy, but they soon went far beyond these limits. An overseer who did not suit them was unceremoniously thrown out of the mill. The mill owners did not dare discharge any of their employes for fear of inciting a riot. Political meetings were held in the mill buildings during working hours. No one dared to interfere with them. In one large spinning mill at Lodz a full set of overseers were shot during one year. At another mill a manufacturer was sitting in his office one morning when a delegation representing the operatives came in, fastened the door, and demanded under threat of death the mill own-

er's consent to certain demands. After several hours he was released only to be shot dead in the mill during working hours.

After this outrage the government made many arrests, visited severe punishments upon innocent persons and finally sunk back into the old regime of corruption.

The wages in Russian mills are low judged by American standards. The following are those prevailing in a Lodz woolen mill:

Picking room: Head man .... 63c. per day
Other picker men ..... 60c. per day

A premium at the rate of $1.22 per thousand pounds is paid to the picker men for anything in excess of 7.200 lbs. per day. Wage in the picker room will average $4.00 per week.

Card room: Card tenders, 50 to 65c. per day

Each one runs three sets of cards, that is, 9 machines.

Card cleaners ..... 75c. per day

A premium of 1 1/2c. per 100 lbs. This premium is divided between all the cleaners. The weekly wage averages $5.00 per week.

Spinners ..... $1.00 per day

A premium of 2c. per 100 skeins. Average wage $9.25 per week.

Doffers ..... 43c. per day

A premium of 1 1/2c. per 100 skeins. Average wage $3.35 per week.

Yarn carriers ..... 68c. per day
Spoolers ..... 42 to 50c. per day

Dressing room: Each dresser has a helper and boy to replace bobbins. Most of the warps are dressed by hand.

Dresser ..... 75c. per day
Helper ..... 43c. per day

Machine dressers work by the piece, being paid from 4c. to 7c. a section. The price varies with the length of the warp. The average wage for a dresser tender is $6.00 per week. When the dresser is compelled to wait for work to come along he is allowed 50c. per day.

On the Continent warps are usually drawn in after being set in the loom. The average drawer-in can handle about 700 ends an hour. The average price for drawing in on plain work is 10c. per thousand ends. For fancy work the prices are as follows: Cotton and worsteds, 10 1/2c.; carded wool, 22 1/2c. The price paid for reeding and warp on the loom is 25c. When compelled to wait for work the drawer-in is paid 9c. an hour.

Warp sizing: The wages paid for this work are as follows:

Overseer ..... 75c. per day
Helper ..... 60c. per day
Beamer ..... 68c. per day
Fulling spooler ..... 48c. per day
Twisters ..... 43c. per day

Finishing room: Sewers that are paid by the piece earn $6.00 to $7.00 per week.

Fullers ..... 68c. to 75c. per day
Giggers ..... 58c. to 65c. per day
Dry steamers ..... 60c. to 65c. per day
Wet steamers ..... 68c. per day
Dryer ..... 63c. per day
Sheer ..... 36c. to 45c. per day

Plate pressers, 9 1/2c. for every press. Wages average about $8.00 per week.

Rotary press ..... 68c. per day
Shipping room ..... 80c. per day
Dye house:
Piece dyers ..... 68c. per day
Wool dyers ..... 63c. per day

According to the Bureau of Statistics, the value of the exports sent from the United States in 1906 was $719,000,000; of this amount manufactured articles formed 41 per cent.

Most of the lace made at St. Gall, Switzerland, is the kind known as "burnt-out lace," and is made on the regular schiffi embroidery machine. It is made on a foundation of prepared woolen or silk cloth instead of the ordinary cotton cloth. After manufacture this is treated with chemicals and the blue or yellow chemical cloth disappears, leaving the cotton lace uninjured.—Special Agent W. A. Graham Clark.

The Compulsory Working of Patents.

Nations, even more than individuals, are actuated by selfish motives. National policies are carried out by officials who are backed by the people. The official, therefore, has a double motive in protecting the interests of his country; first, patriotism; second, personal advantage resulting from having served his people well. For this reason it is generally useless for one nation to ask another to redress a wrong unless the first nation has the means at hand to inflict damage on the second in case of a refusal.

For forty years Germany has been taking advantage of Great Britain and the United States in the matter of patents, by requiring inventors to work their inventions in Germany as a condition to the continuance of the patent, although neither Great Britain nor the United States imposed that requirement on German or other patentees. Appeals during that period for redress were ignored by Germany until Great Britain adopted the German policy of compulsory working and the United States threatened to do the same. Then the German coon cries out: "Don't shoot. I will come down."

It is reported on good authority that the German government has begun negotiations with both Great Britain and the United States for an agreement by which Germany will abandon the compulsory working clause and otherwise ameliorate the conditions under which German patents are granted to British and American inventors, providing Great Britain will not enforce and the United States will not adopt the compulsory working clause in their practice. This and much other interesting information was brought out at the hearings before the patent committee of the House of Representatives on two bills designed to retaliate against foreign countries. The popular sentiment in favor of some action of this kind was thus referred to:

The Chairman (Hon. Frank D. Currier, of New Hampshire):—Here is this tremendous agitation. I do not think you gentlemen realize how much of an agitation it is and how deeply people are coming to feel about it and query whether something along fairly conservative lines should not be done in order to head off more radical and destructive action. This is an agitation which is likely to grow; it has got abroad now.

Mr. Fisher (representing the Patent Law Association):—I submit, who would be more apt to get in touch with that agitation than the attorneys all over the country representing the patent interests?

The Chairman:—The representatives of the people are quite as likely to, those who represent all the people, the inventors, the manufacturers, and the consumers.

Mr. Fisher:—Would it not be, maybe, likely to call for objection and agitation by the manufacturers and those vitally interested in patented articles?

The Chairman:—The letters come largely from manufacturers who are suffering on account of the patent laws abroad, but now that agitation has attracted the attention of the country, members of Congress holding very important rank in the House are asking me to report a bill out just as soon as possible.

Mr. Fisher:—I will simply submit these letters and ask that if it is possible the matter be delayed long enough to ascertain the general sentiment of the patent bar.

The Chairman:—A reasonable time will be given for that purpose. Let me say that I think it would serve the useful purpose of the people whom you represent if you would suggest amendments to perfect the bill.

Mr. Fisher:—By that I suppose you mean House bill 15839?

The Chairman:—I do. In my belief that bill in some form will be reported out, and if it ever reaches the House I think it will pass with an almost unanimous vote. If you can point out to the committee any way in which the bill can be improved, I think it would serve a very useful purpose, certainly to the committee, and I think to the people whom you represent.

At various times during the hearings it was made plain that action was prompted by a desire to retaliate on foreign countries, Germany being the main target:

Mr. Albert H. Walker (a patent attorney):—These bills are evidently framed upon the theory that if we will give them a few doses of their own medicine, they will reform their ways and be less objectionable.

The Chairman:—May I interrupt you to say that that apparently has been the effect of a recent English statute? I understand that since that act became effective on the 1st of January negotiations have been begun between England and Germany for a modification of their patent laws with respect to each other.

Mr. Billings (Assistant Commissioner of Patents):—Of course all patent laws are based upon the provision contained in the Constitution, that the Congress of the United States has power to

enact laws giving to inventors and manufacturers protection, exclusive rights, for the general welfare. It is supposed to be against the general welfare to put obstacles and blocks and taxes and conditions in the way of the inventor. It was believed that the inventor would not sit down and think these things out if he had all these obstacles to overcome.

The Chairman:—And yet, Mr. Billings, do you think this country ought to rest quietly under the hardships we are suffering everywhere abroad on account of their manufacturing clauses?

Mr. Billings:—No; I think that we should communicate with those countries our disapproval of those provisions. All that has been done, of course, through the State Department.

The Chairman:—But, so far as we know, that avails nothing. I will say right here that a very great number of manufacturers and a good many inventors favor H. R. 15839.

Mr. Fisher:—The idea of retaliation is always very pleasing to the ordinary man.

The Chairman:—Who has been suffering, and is suffering now, from the working clause in the laws of foreign countries; yes.

Mr. Chaney (member from Indiana):—The whole subject is entirely new to us, because it has not been a great while ago that England projected this performance, and it has not gone into effect yet, and will not until you get after the thing under the law, and now we are simply trying to give them a Roland for their Oliver.

Mr. Gifford (patent lawyer representing the German color manufacturers):—I understand that a movement is on foot in the State Department to accomplish this very thing with England, and I have a letter here from the Assistant Secretary of State saying that negotiations are in progress at the present time, and I suppose that something of this kind will be very helpful to the negotiations.

Mr. Chaney:—Just like four battleships.

The Chairman:—That is what we felt, that they would not be able to negotiate successfully unless we did something.

Mr. Gifford:—It is important to the public that these things shall be made in one place. And so long as they cannot be made in the United States, let them be made in Germany. They pay a duty on them, anyway.

Mr. Leake (member from New Jersey):—Might not the converse of that proposition be equally true? You can conceive of a substance of which borax is the important part that is not produced or found in Germany. The manufacturers of that product might suffer great inconvenience and hardships by the working clause of the German Government.

Mr. Gifford:—Why, yes; and that is exactly what we are trying to get the German Government to take off.

Mr. Leake:—And if that is our single purpose, it is to use a club over the German Empire.

Mr. Gifford:—Yes.

Mr. Leake:—Then don't you think the club, to be effective, should be just about as large as it is using over us?

Mr. Gifford:—Yes; it is just as large.

Another grievance against foreign countries, in addition to their enforcement of the compulsory working clause, was the high cost of patents, as compared with the cost in the United States. The following statement of total cost of patents for the full term in leading countries was presented to the committee by Mr. Greeley, a patent attorney:

Russia	$1,667
Germany	1,261
Hungary	575
Denmark	550
Great Britain	500
Belgium	400
France	290
Switzerland	265
Luxemburg	240
Norway	168
Sweden	160
Japan	150
Canada	60
Mexico	40
United States	35

An American patent gives complete protection to the inventor for 17 years in the most valuable market in the world. In other words the most valuable patent in this list costs the least.

The burdensome character of foreign patent laws was stated by Mr. Walker:

Mr. Walker:—Now, the European laws upon the subject of working patents have been very burdensome upon American inventors, so much so that I feel very sure that the right to obtain foreign patents is worse than useless to American inventors as a whole. American inventors have sent a great deal more money to Europe and other foreign countries in payment of taxes and in payment for working them abroad than they have ever received back from those countries from royalties or profits, or in any other money derived from them whatever. The Edison incandescent light was one of the most widely patented inventions in foreign countries, contemporaneous with patents in this country in 1880. Those foreign patents, although the invention was one of great value, were sources of heavy losses to the owners of the Edison incandescent light for reasons that varied in the different countries. I myself have taken out patents there, upon my own account and for clients, in ten or a dozen nations of the world, and in not one of those instances during a professional life of thirty years has a single dollar ever come back to the American inventor on account of those patents, and large amounts of money have been paid to foreign countries.

The Chairman:—Will you kindly explain to the committee the cause of that? Is it on account of exorbitant fees and taxes, and on account of the working clause?

Mr. Walker:—It is, plus this consideration, that no American can get any money in any foreign

country on any patent in that country without actually introducing his invention in use there. It cannot be sold upon the paper, and he cannot produce his invention for use except with his own capital until after he has successfully introduced it in this country. I have lately endeavored to induce foreign capital to embark in the introduction in France of an important American invention, and while patented in France, they have been unable to get any headway thus far at all.

I could occupy considerable time in giving details of the difficulties that American inventors encounter in endeavoring to get any reward at all from foreign patents. Suffice it to say that through my experience, I do not know of any instances where an American inventor has obtained any considerable amount of money or any advantage from a foreign patent, and I know of many instances where American inventors have paid out large sums of money without getting any back. On the whole, therefore, I consider that foreign patent laws are of no advantage to American inventors. Occasionally an inventor may get some advantage, but as a whole I would be pleased to learn that every foreign country had enacted a statute absolutely prohibiting the granting of any more patents to American inventors. (Laughter.) Those foreign patent laws are not enlightened; they are drastic, and selfish, and grasping, and highly objectionable, and the question is, What can we do about them in this country?

Livingston Gifford, a patent attorney of New York, appeared before the committee as a representative of the German color manufacturers, and discussed the pending bills with special reference to the artificial color industry:

Mr. Gifford:—Mr. Chairman, I suppose it is proper that I should make the confession that I am counsel in patent matters for some of the principal chemical manufacturers of Germany. Yes, sir; I will say further, that until last week I had intended to oppose any bill upon this subject whatsoever, and had intended to ask that the committee let well enough alone and should not attempt to legislate with regard to this subject at all. But last week, by reason of information that I had as to the remarks of the chairman of this committee, and information that I had from other sources, I became convinced that it was futile for me to appear here and take that stand. It seemed as though the popular sentiment was so much in favor of doing something that it was a mere waste of time of the committee and a waste of my energies and time for me to attempt to oppose the thing in toto. Therefore I last week started to study the matter from the standpoint of endeavoring to see how the committee can accomplish what it has in view by a bill which will be as little damaging as possible. . . .

I think that the system of working is so pernicious, from the standpoint of everybody, either in America or abroad, that it largely destroys the value of patents. I will take the matter up from the standpoint that, bad as the principle is, it is inevitable that for the purpose of retaliation something should be adopted in this line with the hope that negotiations will result between this country and foreign countries that will ultimately throw off the working clause everywhere.

Mr. Gifford made a long argument in opposition to the pending bills from which we take the following extracts:

Mr. Gifford:—Sometimes you could not give away patents if coupled with the obligation to work. In fact, I will say this, and I think it will startle the committee: The great chemical concern, the Badische Anilin and Soda Fabrik, the greatest concern of its kind in the world, if they were to offer to American manufacturers or American capitalists the free gifts of all the patents in the United States that they now own on dyestuff products, on the condition that the recipient of that gift should manufacture those products in the United States, it would be impossible for any capitalist or manufacturer in the United States to accept that gift.

The Chairman:—You mean taking them en bloc and assuming the burden of working them all?

Mr. Gifford:—Yes. And I will go further, Mr. Chairman, I do not believe you could take any single one of them. An American could not even accept the best of them and agree to manufacture it in this country, even though he were relieved from the necessity of manufacturing the poorer ones.

Mr. Chaney:—Why is that so?

Mr. Gifford:—The reason they can be manufactured and made profitable, notwithstanding the small sales of each individual one, is because they are all manufactured en bloc in one factory in Germany, which manufactures for the whole world, and not only manufactures those that are covered by patents, but manufactures the products upon which the patents have expired, and these various products are so interwoven with respect to their manufacture that each one is in aid of another. The by-products of one constitute the raw materials of another. It is a most peculiar condition of affairs that surrounds this chemical industry, and it is a condition which I do not think anybody outside of the manufacturers themselves, or a privileged few who happen to be their counsel in this country, really understands.

Mr. Chaney:—It is worse than a trust, is it not?

Mr. Gifford:—It is a naturally made trust. It is a trust that you cannot get around. It is made by natural conditions. I am opposed to it (compulsory working) because you are attempting to produce a condition of affairs that is opposed to nature. Take as an illustration alizarine red, which was patented in this country, and the patent expired in 1884.

Mr. Hinshaw (member from Nebraska):—What was that article?

Mr. Gifford:—Alizarine red. The patent expired in 1884. You see that is more than twenty years ago. There is no duty on alizarine red; not a cent of duty on it. It comes in free. Alizarine red is sold in this country today more than any other dyestuff. The sales amount to more than a quarter

of a million dollars a year. The alizarine red is not made in this country at all. There is not a pound of it made here.

Mr. Chaney:—That is the reason why it was left on the free list, I suppose, in the tariff?

Mr. Gifford:—Possibly. There is not a pound of it made here. There is no patent on it. There is no duty on it. It is sold and consumed more than any other dyestuff in the United States, and it is all manufactured in Germany.

Mr. Wilson:—Are the various ingredients of which it is composed producible in this country?

Mr. Gifford:—They might be produced, but it would be at such a cost that it would be practically impossible.

Mr. Hinshaw:—What is the relative price of that product in Germany and in this country?

Mr. Schweitzer (of New York):—It is cheaper here.

The Chairman:—They follow that custom of selling abroad for less than they sell at home?

Mr. Schweitzer:—In some cases; what they call "unloading."

The Chairman:—Dumping?

Mr. Schweitzer:—Yes.

Mr. Gifford:—The reason I cite alizarine red is because it shows that conditions that exist, natural conditions by which these things are regulated, irrespective of any patent system, or any tariff, and as to which, if you would compel the parties to manufacture in this country, you would be proceeding against nature. It is impossible for me within the scope of this speech to set forth all the conditions that surround this subject. In fact, I do not know what all the conditions are that surround the different articles of manufacture that produce that result. I can only cite that particular example.

The Chairman:—On this example that you cite there is no American patent?

Mr. Gifford:—No. The reasons why the alizarine red is manufactured abroad are because it is best manufactured and most conveniently manufactured abroad. It would be unjust to put on any of these products a burden here which would be contrary to nature. What is true of alizarine red is true also of a long series of other coloring matters, excepting that they are subject to a duty of 30 per cent. I have made out a list of the substances here which are the leading substances upon which the patents have expired, and which are still exclusively manufactured in Germany. I will read the list. (Reads:)

Alizarine blue; patent expired in 1899.

Alizarine red; patent expired in 1884.

Victoria blue: patent expired in 1901.

Auramine; patent expired in 1901.

Rhodamine: patent expired in 1905.

Methylene blue; patent expired in 1905. In fact the patent was held to be of no use long before that.

Alizarine black; patent expired in 1905.

Indoin blue; patent expired in 1905.

And still the sales of those amount annually to a million of dollars in the United States.

Mr. Wilson:—If the conditions abroad are such that they can produce certain articles so much more cheaply abroad than they can be produced here that they can undersell the manufacturers of similar articles produced here, what is the necessity for patent protection or any other kind of protection in this country?

Mr. Gifford:—To protect them against each other.

Mr. Leake:—Mr. Gifford, then the effect of depriving a German manufacturer of a patent in this country, or imposing such terms upon him as would compel him to work it, would result merely to exposing the American market to the competition of those concerned, and it would inure to the benefit of the American public?

Mr. Gifford:—No, sir. The first part of your statement is correct, but the latter part of your statement is entirely incorrect. And why? Because the first thing that has to occur is to induce somebody to introduce these things into the United States. If all the German concerns were at liberty to manufacture, and the Swiss concerns and the English concerns were, each one, at liberty to manufacture and send these things freely into the United States, the effect may at first sight appear to be beneficial to the people of the United States. But that is taking a most superficial view, because in order to lead to the introduction of a thing into the United States you have to offer some reward to the concern that introduces it. The amount of money that these German concerns have invested in the introduction of products into the United States (for which the only reward they get is due to the protection against each other by the patents in the United States) is something enormous. The machinery of the Badische Anilin and Soda Fabrik for introducing these things into the United States and educating the people of the United States in their use costs that concern at least $150,000 a year. I have the statement here to show it. The Farbenfabriken, of Elberfeld, expends an equal amount at least.

Mr. Gifford pointed out the proper conditions for manufacturing dyestuffs and of the folly of opposing natural conditions, but omitted to state that it was by such opposition that the German color industry was established and has been developed:

Mr. Gifford:—The fact that there are other conditions at work besides patents to control the place of manufacture is sufficiently illustrated by the fact that neither alizarine red nor alizarine blue has ever been manufactured in this country, although neither is the subject of any duty (sic), and although the patent on the former expired in 1884 and on the latter in 1899, and although the sales in America of the former in 1907 amounted to over a quarter of a million dollars. The proper locus of the factory for these products is determined by accessibility of raw materials, skilled labor, technical knowledge, and national temperament. To attempt by coercion, as a condition of patent protection, to change the locus of the factory is contrary to every principle of our patent system and in the long run destructive of its benefit to the American public.

H. Schweitzer, of New York, unconsciously gave a touch of humor to the pro-

ceedings by suggesting that the patent question be settled by negotiating an agreement with Germany as was done on the tariff question last year:

Mr. Schweitzer:—Mr. Chairman, I just take the liberty of saying a few words. The remarks which you made put an entirely different light on the whole subject-matter. It seems that Congress is going to do something, and that the President is trying to do something through the diplomatic channels. The law seems to be primarily directed against the German patent law.

The Chairman:—Not at all; the French law is much worse than the German law, so far as Americans are concerned.

Mr. Schweitzer:—I know. But Germany, I mean, is our greatest commercial competitor, and I suppose we ought to be a little more afraid of Germany than of France, perhaps. About two years ago we had a commission sent to Germany to arrange a commercial treaty. Would it not be possible, before enacting any law which might hurt the American inventor in the end, that a bill should be introduced creating a commission like that—perhaps of three gentlemen who are versed in patent matters—and try to force, in that way, the German Government to come to some concession or to arrange a patent law which will please the German people as much as the Americans? Would that not be possible? Would that not be a less dangerous weapon than a law of the kind which you have introduced?

The Chairman:—Possibly so; but we are dealing with actual conditions here now. You gentlemen all realize that public sentiment on matters of this kind differs materially from public sentiment when you had this matter up before, and it is a question whether this committee will not decide to do something, and if you get into a wrangle and cannot report this bill out in some form, whether this committee will not just report out the other bill, because a formal vote of this committee instructed me to draft and introduce this second bill.

Mr. Cromelin:—I happen to be a member of the American Association of Commerce and Trade of Berlin, Germany, and I have listened to this discussion with great interest. I come in as a stranger. I do not know what efforts have been made with the purpose of bringing about a deal with Germany, but I do know that our association had a great deal to do with a bringing about of tne meeting of the commissioners between the two countries for the adjustment of the tariff. That association has 175 members. I agree with these gentlemen that while the retaliatory measure is probably the right course to pursue, as the manufacturers have suffered a good many years in Germany because of the conditions that exist there, chafing under the present English laws and the laws as they exist in France and Germany.

I believe that steps should be initiated at once to act on the suggestion of the gentleman and see whether or not these great American firms doing business in Germany, and who will be the ones most to suffer if a further retaliatory measure is passed by Germany, cannot, through their agencies abroad—through the consular service—make representations to the proper commercial bodies in Germany, Berlin and Bremen with a view to a commission such as the North commission, which went abroad and which, in a very quiet, modest way, performing great service for the benefit of the two countries. I merely make that as a suggestion as perhaps one of the ways this could be done, unless it is the intention to pass this bill at the present session of Congress. I venture to state that if this Congress passes that first bill, it would not be many months before many of the European countries would take steps to amend their patent laws so as to make the conditions more favorable to American manufacturers doing business in foreign countries.

Congress adjourned without taking action on the patent question, this course doubtless having been adopted in order to give the administration an opportunity to reach an agreement with foreign countries through diplomatic channels. There is no danger of American rights being surrendered as was the case with the German tariff agreement of last year. Any agreement regarding patents must necessarily be in the form of a treaty ratified by the Senate. Accordingly we may expect the question to come before Congress next winter for final settlement.

ELECTRIC POWER APPLIED TO TEXTILE FACTORIES.

BY WILLIAM B. WOODHOUSE.

(A Paper read before the Bradford, Eng., Engineering Society.)

Mills and their machinery have, in the past, been designed to meet the conditions imposed by the mechanical drive, that is to say, the rooms and floors have been so placed that a main drive from the engine to each room could be effected with economy and simplicity, and the machines have been grouped and designed to be grouped for driving from line shafts. The driving shafts of spinning frames have been run at low speed compared to that of the spindles, because of the engine speed being low and the increase in speed from engine to spindles has been performed in steps by the intervention of belts and gearing.

The electrical motor, however, is a high speed machine and its first cost per horse power is lessened as the speed is increased. Textile machinery then is likely to undergo a change of design in the direction of an in-

creased speed of the driving shaft, which change of speed should in spinning machinery result in an improvement. The general advantages of electrical driving are well known and the subject is too wide to be treated as a whole in the extent of this paper. It is proposed to consider only the following special points:

1. Nature of the textile load as affecting the method of driving.
2. Advantages of the individual drive.

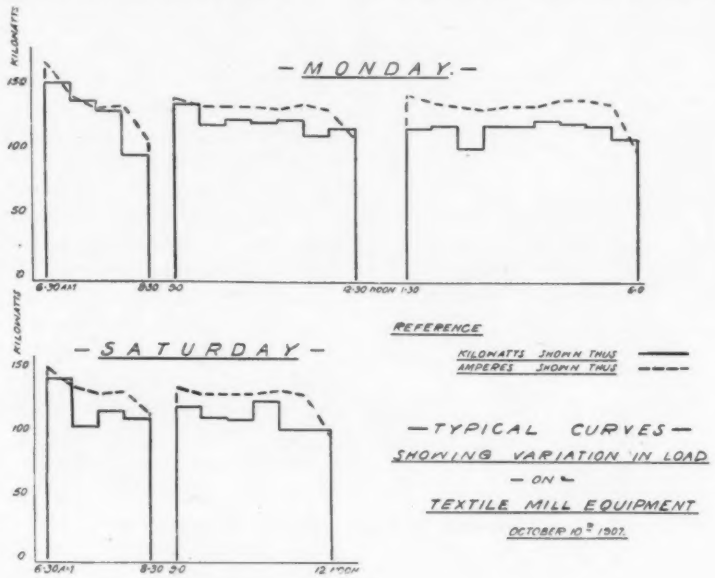


Fig. 1.

3. Economical use of Capital.
4. Effect of speed on output.
5. Public Supply versus Private Plant.

NATURE OF THE TEXTILE LOAD.

In considering this matter we are first met with the point that a very large proportion of textile machines are required to be run at a constant speed: and it is for this reason that the most suitable type of motor is the alternating current induction motor. This motor has other advantages over the direct current motor, simplicity and lower first cost being the greatest. The adoption of direct current except in special cases is to be strongly deprecated.

In dealing with the estimation of the power required to drive textile machinery electrically and with the annual running cost, the engineer has met with considerable difficulty owing to the practical difficulty which the mill owner had in estimating his power other than as indicated horse power. The variation of the power required by any machine in its operation can be observed only when it is electrically driven and therefore many false estimates of the number of units which would be consumed have been made. The power costs in a mechanically driven mill are calculated on the basis of the cost of an indicated horse power hour and the load has been assumed to be a steady one or nearly so. This has led in many cases to a serious over estimation of the cost of the electric drive.

The load on textile machinery is in no case absolutely steady and in the case of looms and mules is of an extremely variable nature; moreover the power taken to drive the machines varies throughout the day and according to the weather. The accompanying curves exemplify this. Fig. 1 shows the variation of the total power required to drive a mill throughout one day.

Coming to the individual machines, records have been taken electrically of the power required to drive them and it may be noted here that the taking of such records

is a matter of extreme simplicity with the electrical drive: continuous daily records can be taken automatically in every department of a mill. Fig. 2 shows the variation of load on a motor driving a group of 12 looms. Fig. 3 represents the variation of load on a

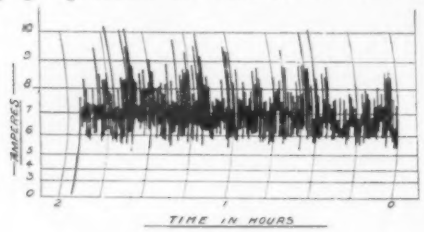


Fig. 2. Load Curve. Looms.

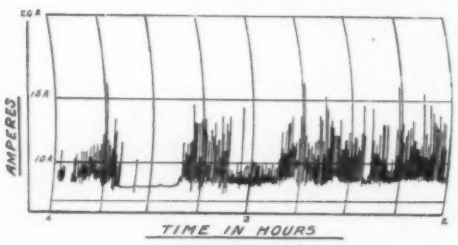


Fig. 3. Load Curve. Mules.

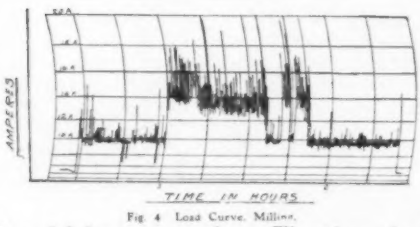


Fig. 4 Load Curve. Milling.

motor driving two mules. The time during which one or both machines were stopped can be clearly seen. The consumption of electricity varies in accordance with the load and it will be noted that the average consumption is about one-half of the maximum, that is to say, a perfectly steady load of the same horse power would have consumed twice the number of units. Fig. 4 indicates the variation of load on a motor driving a milling machine, teazer and willey. It is obvious that the energy consumed was extremely small in comparison to the maximum load. With the knowledge gained by such records as these it is quite easy for the engineer to estimate closely the amount of electricity required per annum to drive any class of machinery, furthermore, one is frequently able to point out that a certain machine is consuming more power than is consistent with proper working. Faulty adjustment, stiff places and other faults are in this way very easily detected.

THE INDIVIDUAL DRIVE.

A disadvantage of the collective mechanical drive of various classes of machinery from an engine which is not generally appreciated is that of the reflection of speed irregularities from one class of machine to another; for example, the variable load due to mules causes a variation of speed not only on the mule countershaft, but throughout the whole mill, so that the carding machines or spinning frames in another department suffer a variation of speed which tends to decrease the uniformity and quantity of the rove or thread they produce.

In the individual drive each particular operation is independent of any other. The first important advantage of the individual drive is the elimination of belts, gearing and shafting. This represents a considerable reduction in the power required to drive the machinery. In a number of mills tested by the author the loss of power in engine and shafting, bearings, belts, etc., amounted to from 30 to 50 per cent. of the total indicated by the engine.

Tests of various mills have shown that the power taken to drive 100 feet of shafting, running light, amounts to one unit per hour on an average. Belts are equally bad offenders. In a paper before this society read by Mr. H. A. Jones, in 1905, particulars of tests were given showing that with belt driving the loss amounted to 5 per cent. per belt and with rope driving 6.6 per cent. All these losses of power are difficult to check with the mechanical drive and they all increase with age. The no-load "friction" card of an engine does not give the true power as both bearing and belting losses are greater as the load increases, due to the extra pull.

Mill fires have often been attributed to overheated bearings; with the electrical drive the motor ammeter would show an increase of load due to such a cause and the danger would be removed at once. Gear losses are considerably more than those of belt or ropes and when we consider speed records

we shall see a further disadvantage. This matter of speed, however, is so important that it will be treated separately.

The second great advantage of the individual drive is in the freedom from limitations as to the position of machines which is imposed by the nature of the mechanical drive. Machines can be arranged with only one object in view, namely, the economical handling of the products of manufacture. Such processes as rag-grinding and willeying can be performed in outlying sheds removed from the main buildings. Washing, dyeing and milling can be carried on in a position in which the steam and moisture is not conveyed to other parts of the mill. Every odd corner of a site can be utilized.

Furthermore, where the principle of the individual drive is adopted to its fullest extent, viz., a motor to each machine, then each machine is entirely independent of its neighbors and if stopped is taking no power at all. The effect of stopping and starting a loom in a group is felt by each of the other machines and produces a variation of speed with a corresponding tearing of the threads and a variation of the texture of the material. This cause being removed, a higher

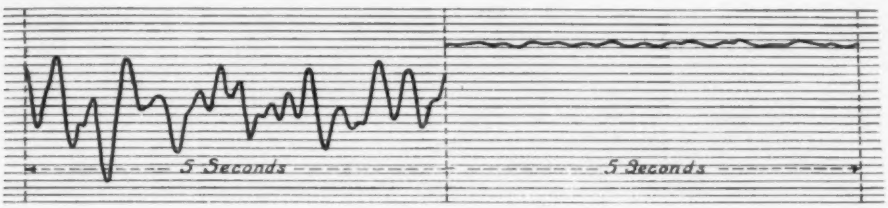


FIG. 5.

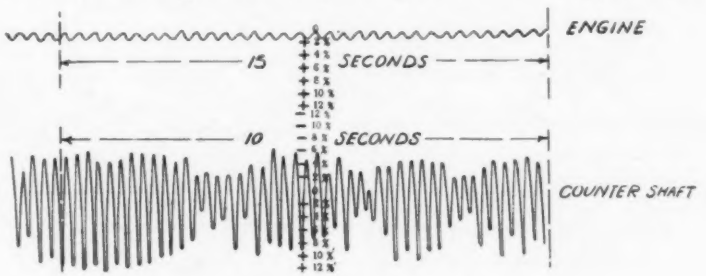


Fig. 6 Speed Curves. Variation, 3% and 20%.

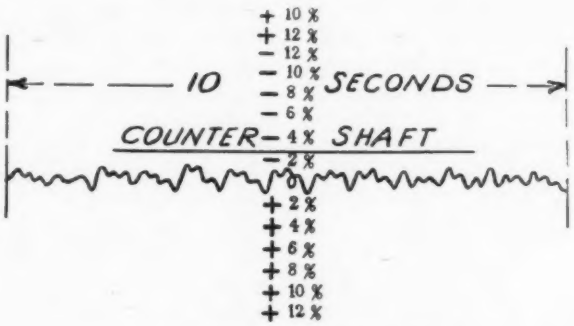


Fig. 7. Speed Curve. Variation 3%.

maximum speed may be, and is, adopted with safety. A case of interest may be quoted. A group of looms were mechanically driven, the tachograph showing a considerable variation of speed on the countershaft which ran 84 revolutions per minute. On conversion to electrical driving the speed variation was diminished and the speed of the countershaft raised to 96 revolutions per minute without increasing the loom stoppages due to broken ends, etc. The output from the looms was increased in all by 24 per cent.

The removal of shafting and belts admits more light and removes a principal cause of dust and dirt. The silk manufacturers in Switzerland and Italy where the weaving is carried on electrically consider this a potent reason. Cleanliness and saving of space have been noted. The motor may be perched on the wall or roof; may be underground or on the floor—in fact may be put anywhere out of the way.

The power costs of each department can be accurately determined and a check kept on the efficient working of the machines and their minders. Instruments recording the variations of load, such as were used to take the records above shown, may be permanently installed. Where this has been done many interesting things have been noticed. How, for example, the time taken to get all machines running is longer on Monday than any other morning; how there is quite a spurt in production when the owner appears on the scene and how human nature anticipates the week-end stoppage on Saturday mornings. All these points tell on output and the instruments are always on the watch.

ECONOMICAL USE OF CAPITAL.

In the matter of capital cost the electrical drive effects considerable saving in a new mill. The building may be much lighter in construction due to the lessened weight of shafting and the following reductions may be taken as results to be expected:

Reduction in cost of building, 10 per cent.

Reduction in cost of shafting, 60 per cent.

Reduction in cost of belting and ropes, 66 per cent.

Where the electric power is taken from a public supply there is a further reduction in that the cost of the engine, boilers, chimney and buildings, mill, dam, etc., is avoided. Manufacturers who have converted existing mills to the electric drive, taking a public supply have, in many cases, paid the greater part of the cost of conversion out of the money realized from the shafting, pulleys, etc., removed.

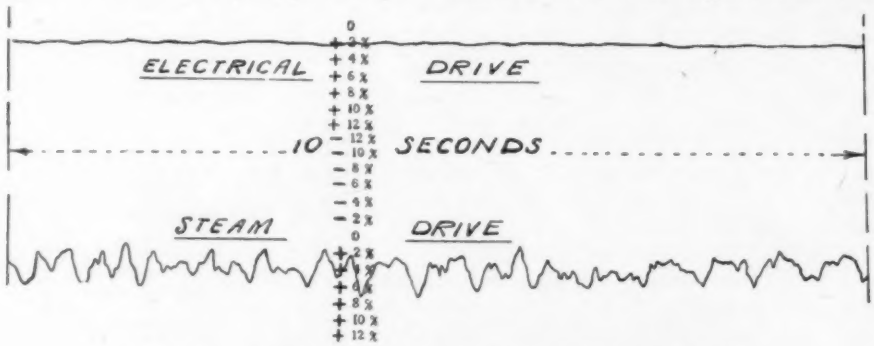


Fig. 8. Speed Curves. Variation—Steam, 7%; Electric, ½%.

The reduction in the amount of capital spent on machinery which is not directly productive, such as steam engines, shafting, etc., has an important effect on the return on the capital expended in a mill.

For example, a mill requiring 200 h. p. may be assumed to have cost $50,000, of which productive machinery cost say $25,000 and steam plant $12,500, the corresponding cost of an electrical equipment being $5,000. Now let us assume the gross profit on the business was 30 per cent. on the turnover before paying power costs, management charges, rent and rates, etc. This profit is earned by the productive machinery and if the $7,500 difference between the cost of mechanical and electrical drive be spent on fur-

ther productive machinery, we have in one case $25,000 and in the other $32,500 of directly money earning plant with the gross profits increased in the same proportion, viz., 13 to 10, and the net profit, as the management charges are unaltered, at a still greater rate.

EFFECT OF SPEED ON OUTPUT.

The most important claim that can be made for electric driving from a public supply is that of increased output due to steadiness of speed. The Yorkshire Electric Power Company's supply is by three phase alternating current, the power being generated by steam turbines whose speed is practically constant, there being no cyclical irregularities such as occur with reciprocating engines. The type of motor driven from this supply, the alternating current induction motor, has the property of running within 2 per cent. of synchronism at all loads, which is to say that the speed of any motor on the system is absolutely determined by the speed of the power station turbines and is, therefore, uniform day in and day out. This property of the alternating current system is well recognized as may be realized from the fact that in some German towns the public clocks are driven by the electric supply. So, if a motor is coupled to each machine the machine will run at constant speed, independent of load, climatic conditions, or other causes, which affect belt transmission. In a number of mechanically driven mills a speed recorder is fixed on the engine and it usually shows a fairly steady reading, but steady speed is wanted at the machines and in between them and the engine there are belts and ropes slipping and varying all the time. The result may be seen from some of the accompanying curves taken by a sensitive and accurate speed recorder.

Fig. 5 shows the variation on a mule countershaft before conversion to the electric drive and after. The average speed in the one case is 15 per cent. lower than the other. In the second case, in fact, it was found possible to increase the maximum speed due to the absence of irregularities so there was a two-fold gain of speed and output. Moreover the quality of the thread spun was improved. Examination of the yarn or cloth produced by the two drives

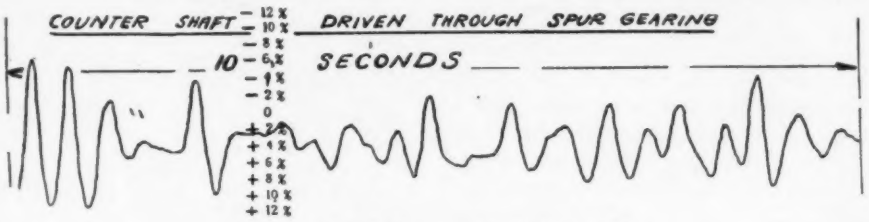


Fig. 9. Speed Curve. Variation. 18%.

bears out the fact that not only is quantity improved but also the quality.

Fig. 6 is of interest as showing the corresponding variations of speed on an engine crank shaft and a countershaft driven mechanically from it, 14 looms being driven from the countershaft. The speed variation on the engine is only 3 per cent., but on the loom countershaft it rises to 20 per cent. This result was obtained in one of the most modern and best equipped mills in the district. Compare this to Fig. 7 which shows the speed variation of the loom shaft when converted to the electric drive, reduced to 3 per cent.

Fig. 8 gives a comparison of the speed of mechanical and electrically driven carding sets.

Fig. 9 shows the effect of spur-gearing, the ideal rolling of the pitch circles, which we assume cycloidal and involute teeth to give us, is in practice obviously not obtained.

To put the importance of speed before you in a simple manner a hypothetical case may be taken of a mill having an annual turnover of $250,000 per annum. In one case it is assumed that power is obtained from the mill engine, in the other that the public electric supply is used, with a consequent increase of output of 10 per cent. It is assumed that as

a portion of the wages paid are at piecework rates the wages are increased 5 per cent.

The trading results would be as follows:

COMPARISON OF COSTS AND PROFITS.

Mechanical Drive.

Turnover $250,000 per annum.

Material	$100,000
Wages	75,000
Management, rent, rates, etc.	12,500
Power and heat	12,500
Profit	50,000

Electrical Drive.

Turnover $250,000 per annum.
Add 10 per cent., $25,000, per annum.
$275,000.

Material	$110,000
Wages	78,750
Management	12,500
Heating, etc.	5,000
Electric power	7,500
Balance—profit	61,250

It will be seen that the increased output due to steady speed represents an extra profit of $11,250, an amount more than sufficient to pay the electric power bill.

ADVANTAGES OF A PUBLIC SUPPLY.

The advantages of a public supply may be summarized as:

1 Reduction in capital expenditure or an equivalent increase in production with the same expenditure.

2. Steadier speed at all loads due to the larger generating sets employed by the power company.

3. Greater security of supply due to the provision of spare plant by the power company.

4. Freedom from the necessity to watch the coal market and keep in touch with the improvements in steam plant.

5. Freedom to make extensions or alterations and to run overtime in any or all departments at a cost proportionate to the power used. The heavy cost of running overtime in one department of a mechanically driven mill is avoided.

6. Capital is expended on motors having a high efficiency which does not decrease with age, expenditure on steam plant is on machinery which not only depreciates in value but decreases in efficiency.

7. Cheaper power.

I have put the point of cost last, as although the public supply can be and is given cheaper in many cases than the cost of power in isolated plants, yet the great advantages of increased output per machine and increased productive machinery per pound of capital outweigh the power costs considerably, and if these be taken into account the price which the manufacturer can afford to pay for the public supply is much higher than that at which it can be bought.

The power costs in textile manufacture are usually a small proportion of the total costs of production and their importance compared to increase of output are small. Where capital has to be spent on a new mill there can be no doubt as to the advantage of the public supply, and manufacturers whose mills are already equipped cannot afford to be left behind in this matter.

Finally a word of warning. The results indicated above can only be obtained when the electrical installation is designed by someone thoroughly familiar with the problem. Early experiences of electrical driving were in some cases unsatisfactory for this reason.

The value of the merchandise imported into the United States from the Philippine Islands for the year ending June, 1907, was $11,510,438; of this amount Manila hemp represented $10,776,622.

Of the 11½ million dollars' worth of merchandise sent from the Philippine Islands to the United States in the year ending June, 1907, nearly 10 1/2 millions was brought in foreign vessels.

Swiss embroidery is made by "stitching" on a foundation of cloth, and the process on a schiffi machine is similar to that of a sewing machine, but instead of a single needle there is a row of needles, and instead of the cloth being laid horizontally it is fastened vertically.—Special Agent W. A. Graham Clark.

HOW TO LINE UP A LATHE END ON A CROMPTON & KNOWLES BROAD LOOM.

There has been a number of different opinions on this particular point and very few agree as to which is the proper way. Let us first consider the results if a lathe is not in proper order so that the shuttle will travel straight. A shuttle being thrown out of line will cause filling cutting on the side of the shuttle box; it will make the warp run badly; it will bend the feeler wires on the stop motion; cause the shuttle to fly out of the loom and also strike against the side of the shuttle box and thus prevent the shuttle from going into the shuttle box as it should. The result on the next pick of the loom is that the shuttles come together and here is a shuttle smash, which takes from one to two hours to fix, according to the quality of goods woven. If the weaver fixing the smash is not experienced, she is liable to draw the colors in wrong and weave with a wrong draw, which has to be fixed in the finishing room. If it is not detected until it comes to the finishing perch, the piece is a second.

There are also other losses, caused by the loom not being adjusted properly. Filling cutting will sometimes catch on six or eight inches after the shuttle passes through the shed, thus causing a broken miss-pick. The weaver does not see this until several inches of cloth is woven and then in order to have the cloth perfect must pick this out. The loom fixer will often keep the loom stopped while he is filing the shuttle boxes thinking that a rough place on the box is the cause. He will often secure a piece of lace leather, which is very expensive, and wind it about the shuttle guard to prevent cutting, when a piece of cloth would do as well. But he generally finds that this does not prevent the trouble. The picker is then taken off and the hole gouged out, or else a new picker put on before the old one is half worn out. These pickers are very expensive and should be used as long as they will last. When a new picker is put on or an old one gouged out, the shuttle will not throw as crooked, but it does not take long before the sharp point of the shuttle makes a new hole and then the same trouble develops. If the lathe is in proper condition at the ends, a picker should run until the point of the shuttle had very near gone through the back end. While all these changes are being done, the company and the weaver are losing money.

The shuttle will often strike the stop motion bending the feeler wires and very often breaking them. The loom is stopped while the weaver looks for the fixer and the fixer often sets up the cam on the stop motion dagger so as to bring this out of the way of the shuttle. In so doing the loom will stop before the filling is run out or will not stop when it is run out, so that the cam has to be put back, thus causing a loss in production. The shuttle being thrown crooked will often fly out of the shed, sometimes a short distance from the edge of the cloth and a great many times from the centre, often striking and injuring the weaver. When the shuttle strikes the box guard after being thrown crooked and does not enter the filling box, or when the shuttles come together, a fixer often thinks that it is caused by the box motion and begins to work at this point, when the difficulty is caused by the shuttle not being thrown true.

To remedy this trouble it is necessary first to see that the point of the shuttle strikes the picker in the same place when the shuttle is at the extreme end of the shuttle box as it does when the shuttle is about to leave the picker at the outer end of the box. If we are running a 2 7/8 inch picker, the shuttle should strike about 1/2 or 5/8 of an inch from the outside of the picker. If it strikes farther out, pack out the casting that holds the picker rod so that it will strike as it should. Some fixers pack out the shuttle box guard, but I would not recommend this. Try the shuttle again and if it is not striking properly keep adding to the packing until it is all right. Do this on both sides of the loom. Take a straight edge that will reach from the extreme end of the filling box to the centre of the loom. Hold the straight edge firm against the back of the filling box so that there is no space between the straight edge and the front box guard and the back of the race plate is exactly on a line with the straight edge, about 12 or 14 inches from the front box guard toward the centre of the

loom. Have the lathe end packed so that the race plate can be seen back of the straight edge and then widen out to about a quarter of an inch at the centre of the loom. The back of the race plate should be on a straight line with the straight edge for 12 or 14 inches. The race plate should then begin to appear so that fully a quarter of an inch can be seen at the centre of the loom. With both ends of the lathe packed in this way the difficulty will be overcome.

- C. T. Donlevy.

OILING WOOL.

BY YORKSHIREMAN.

Probably no process in the manufacture of woolen yarns is so generally neglected or so unscientifically conducted as the oiling of stock for the carding operations.

And yet there is no process which can so easily upset the best calculations in the departments of dyeing and finishing, as this, or which can make itself felt with such far-reaching effect even to the counters of the selling house and beyond.

The mill superintendent who has not had his dark hour on account of oil and oil emulsions is a rarity, but the result of these experiences has largely been to create a prejudice in his mind against trying anything new, rather than teaching him the scientific reasons why he wants certain results, and the best chemical formulae for obtaining them.

In this country particularly, where the tendency is to sacrifice nearly everything to quantity of output, and the cheapening of methods, the woolen industry has fallen upon evil days in this respect, and the inability of American manufacturers to approximate, except in a few rare instances, the colors and finishes of European mills, is attributable in no small degree to this question of oiling the stock.

For the most part European mills do not use emulsions, but use the oil straight, adding an alkali in the subsequent washing process, and letting the oil make its own soap. It is impossible to convince a Yorkshire manufacturer that he can efficiently oil his stock with water, which is what the use of an emulsion largely means. He claims that by his method he uses no more oil in the end, and that the eventual cost is no greater, by reason of the higher percentage of efficiency of the machinery through which the stock passes, the reduction of waste, and the increased ease with which the goods are cleaned on completion.

Unquestionably the greater dryness of the atmosphere in this country, which tends to a noticeably lower percentage of moisture in the wool than generally prevails in Europe, is a partial argument in favor of emulsions as against straight oil, but this does not justify the universal retention of a custom which is fundamentally unscientific in itself.

Again the European manufacturer knows well that if he endeavors to use an oil because he saves a few pence per gallon, he is not necessarily effecting an economy. He may be buying an expense, and a large one at that.

He may be tempted to use a cheap oil which will work well on the cards and in the spinning, but he stops to consider what it will do in the dyeing and finishing, and whether he can scour it out of the finished cloth.

American methods have been injured by the flooding of the market with cheap oils and oil compounds, one of the greatest banes that has ever affected the industry.

When a manufacturer buys a compound, he places himself absolutely in the hands of the oil merchant. He never knows and can never know, unless he has each and every shipment chemically analyzed, what he is getting.

The insidious forcing of the use of mineral oils in the manufacture of woolens by means of these compounds is the most fruitful source of these difficulties. Most mill agents are attracted by a bright, clear oil, which makes a white, creamy emulsion with but little alkali, and which will carry two or three to one of water, and which, furthermore, can be bought for anywhere from eighteen to twenty-five cents per gallon, but when they find that the emulsion either does not oil their stock, or that they have to use so much of it to make it do so that they

"gum" their cards, or that the dyer and finisher are at constant war with the carder, they should learn the old lesson that the cheapest is often the most expensive.

As a matter of fact mineral oil once put into the stock can never be completely scoured out. It is a chemical impossibility to do so, the opinion of many practical men who are using it, to the contrary notwithstanding.

The finished goods may look and feel all right, still the oil is in the fiber, and will inevitably show some day as a dust and dirt holder, whether in a lady's dress, a man's suit, or a house carpet.

When a man who has used such an oil figures up his costs with his back turned to the future, taking the cost of the oil into consideration, and figuring his soap costs by the barrel and his labor costs by the week, he is apt to congratulate himself upon his exemplary economy in oiling his stock, but in time he will learn that the cheapest is often the most expensive.

The chief desideratum of wool oils should be their grease value, not their cheapness, nor the ease with which they emulsify, and no false sense of economy should be allowed to obscure this fact.

The European manufacturer long ago learned this fact, and instead of mineral oils, and cheap distillations from hog and steer refuse, he insists on using a high class olive oil, or a wool grease oleine distilled from the grease of the wool itself, which do not contain hydro-carbons that can be only partially removed, even by the use of strongly alkaline soaps.

A NEW SHUTTLE.

The loom shuttle shown in the accompanying illustration has recently been patented, and is designed to facilitate the threading operation. Fig. 1 is a perspective view; Fig. 2, a section through the eye. The side passage, 6, is curved and provided with a metal lining, which can be omitted if desired. The wire coil, 8, is the threader.

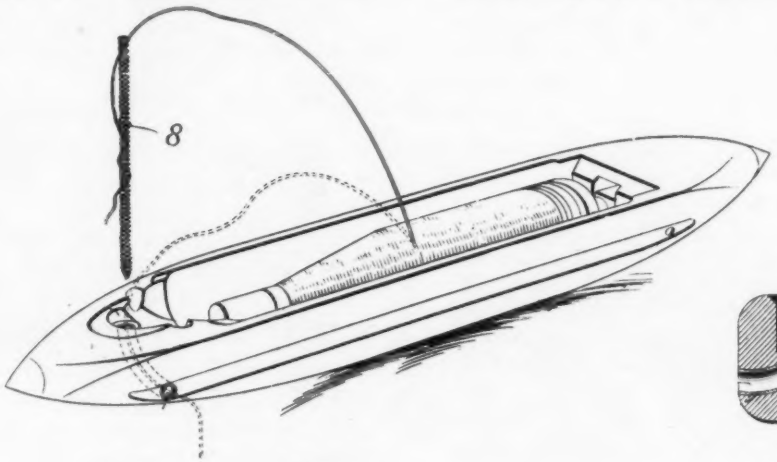


FIG. 1.

FIG. 121.

The filling thread is wound a couple of turns about the coiled threader, the thread readily passing between the coils, after which the leading end of the threader is inserted into the pot-eye, and being flexible, follows the curvature of the side-eye and emerges at the side of the shuttle. From this position it may be drawn and with it comes the filling-thread. The engagement between the filling-thread and the threader is very slight, so that, as a result, after the threader has passed through the pot and side-eyes the thread will become disengaged from the threader without further effort upon the part of the operator. The threader is flexible and readily follows the contour of the side-eye.

CORRESPONDENCE AND NOTES

Upon Textile Topics At Home and Abroad.

BAGGING FOR COTTON BALES.

We published in our June issue an article on "Bagging for Cotton Bales" by Thomas Woodhouse, Dundee, Scotland. The following letter is written by Mr. Woodhouse in response to our request for additional information bearing on the cost of the different bagging fabrics.

Dundee, Scotland.
May 25, 1908.

Editor Textile World Record:

About a month ago the American cotton bagging and the Liverpool mending bagging were selling at 3d (6 cents) per yard; the Sea Island bagging 4 1/2d (9 cents) per yard, and the 40-inch burlap, 2d (4 cents) per yard. In order to get today's prices, May 25, I telephoned to the manufacturer this morning, and find there is a slight alteration. The American "cotton" bagging is now cheaper than the mending bagging. This is because they are trying to push the American bagging. I suppose the buyers are hesitating on account of the unsatisfactory conditions.

Today's prices are as follows:

40-inch burlap and Hessian, 2 1/2d (4 1/6 cents) per yard.
40-inch 2-lb. Liverpool mending bagging, 2 13/16d (5 5/8 cents) per yard.
40-inch American cotton bagging, 2 11/16d (5 3/8 cents) per yard.

All f. o. b. Dundee. The Sea Island bagging is packed and baled, f. o. b. Dundee at the following prices:

44-inch Sea Island bagging, 4 1/8d (8 1/4 cents) per yard.
50-inch Sea Island bagging, 4 1/4d (8 1/2 cents) per yard.

In addition to the above typical cloths which are used for packing cotton, there is a great variety of other types of bagging, such as sacking and tarpaulings, which might prove satisfactory.

Thomas Woodhouse.

CORRECTION.

The 5 illustrations accompanying the article "Bagging for Cotton Bales" by T. Woodhouse published in our June issue were numbered wrong.

Fig. 1 should be Fig. 4.
Fig. 2 should be Fig. 3.
Fig. 3 should be Fig. 1.
Fig. 4 should be Fig. 5.
Fig. 5 should be Fig. 2.

DESIGNING AND WEAVING DOUBLE PLAIN CLOTHS.

BY A. R. FOSTER.

In ordinary textile designing, the design on the point paper always shows some resemblance to the weave of the cloth and this fact alone makes the designing of most single cloths a comparatively easy matter. When it comes to double or multiple cloths, pile or plush goods, leno or cross woven effects, however, this simple guide is lost and nothing but long practice will make them as easily readable as simple cloths. Double cloths are especially troublesome in this respect and the difficulty increases as the material becomes three or more ply, many skilful textile designers, even, never mastering this branch of the work. The study of double plain cloths should, however, present no difficulty if carried out on proper lines and an attempt will be made in these articles to treat them in an entirely new manner and one which will avoid the pitfalls of the usual system. To begin with, a multiple cloth should never be treated as one fabric in the

earlier stages of the design and really in no stage unless when the bindings, which stitch the cloths together, are being inserted. Even at this point it should never be forgotten that what are practically separate cloths

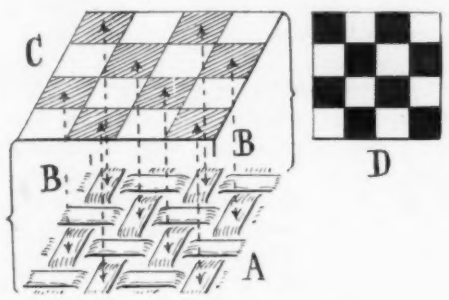


FIG. 1.

having independent designs, are being dealt with.

For the sake of demonstrating the system, a plain cloth is first shown in Fig. 1, in which the reader is supposed to be facing the ends of the warp threads. A diagrammatic view of the fabric is given at A and at each intersection of the threads where a warp end floats over the filling a corresponding shaded square is projected up to the design, C, the lines, B, showing the connection between the two. To bring this down to the ordinary method of marking, the weave is shown at D marked on ordinary point paper. It will thus be seen that A, C and D are merely different ways of showing the same thing, the first giving the cloth and the last the working design.

This method of illustration can be extended to multiple cloths and Fig. 2 shows it applied to a double plain cloth—really to two cloths like the one given in Fig. 1. In this case, A is the face cloth and B the backing cloth, while the lifts of the warp threads are projected up to the squared sheets, C and D, by the lines, E and F, respectively. The two point paper designs are given at G, but it is obvious that as the latter now stand, no appreciable progress has been made beyond what was shown in Fig. 1.

What is now required and what Fig. 2 lacks, is a method of running the two designs, G, into one, just as the cloths, A and B, are actually one dual fabric. To do this the design of each must be marked on the same paper and in one plane, although the two cloths themselves, however firmly bound together, still remain in two planes. This can only be done by blending the design, C, into the design, D, or, in other words, apportioning the point paper, G, between the two cloths.

As this is the place where the difficulties of multiple cloth designing are focused and where otherwise skilful designers of single cloths turn back or become bewildered, various ways will be here given of grasping the

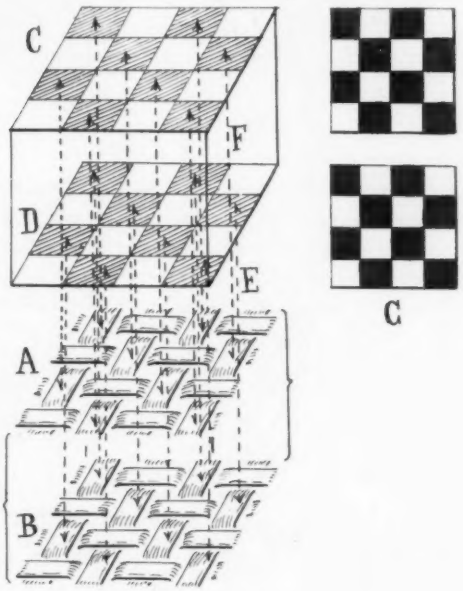


FIG. 2.

difficulty. If the principle is thoroughly understood before going further, multiple cloth designing will be comparatively easy, while if it is only partially comprehended there will be other troubles apparent at every turn.

Again referring to Fig. 2, it will be seen that the marks in the squares of C and D are alike, but this is only a coincidence and one which may be misleading. Even if this likeness could always be relied upon, one set of marks could not be made on the top of others, while there are other considerations which would make such a course impossible. At C and D, Fig. 2, the marks fill the whole of their squares and one way of explaining

the next process is by supposing that only a portion of each square is available for each set. For instance, in Fig. 3, instead of filling the whole of each square at C and D, the warp lifts of the lower cloth are projected on

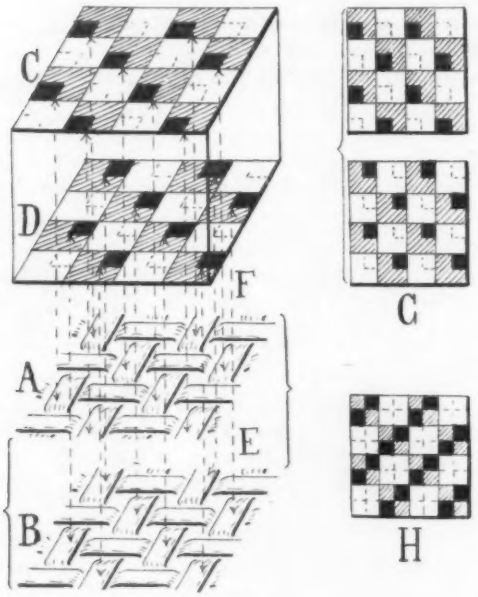


FIG. 3.

to the upper right hand corner of each square affected in the plan, D, while the warp lifts of the upper cloth are thrown up to the left hand bottom corner of the plan, C. If, then, the point paper plans, G, of the designs, C and D, are superimposed, the effect shown at H, Fig. 3, is obtained, but it must be distinctly understood that this is not by any means the completed design. To obtain this latter it must be remembered that while the warp in the lower-cloth goes alternately over and under the lower filling threads, the warp in the top cloth not only interlaces with its own filling in the same manner but, irrespective of bindings, floats over all the weft in the lower cloth. Before going into this matter, however, attention is directed to Figs. 4 and 5 as showing by another method the overlapping of the two sets of threads in a double cloth.

In Fig. 4 there is the design of a plain cloth given at A as representing the upper cloth, which is marked on ordinary squared paper in the usual manner, while B is a similar design marked in the same way for the lower cloth. The large squares at C in Fig. 4 correspond with those of A, while the large squares at D correspond with those of B. In C and D, however, the squares are divided into four smaller squares and only one of each of these quarters is considered at the present. Thus, at C, instead of filling in a whole square, only the bottom left hand corner is used for the face cloth design as in the preceding figure and the same applies to the top right hand quarter of the squares in D for the back cloth design. To distinguish these apportioned parts they have been

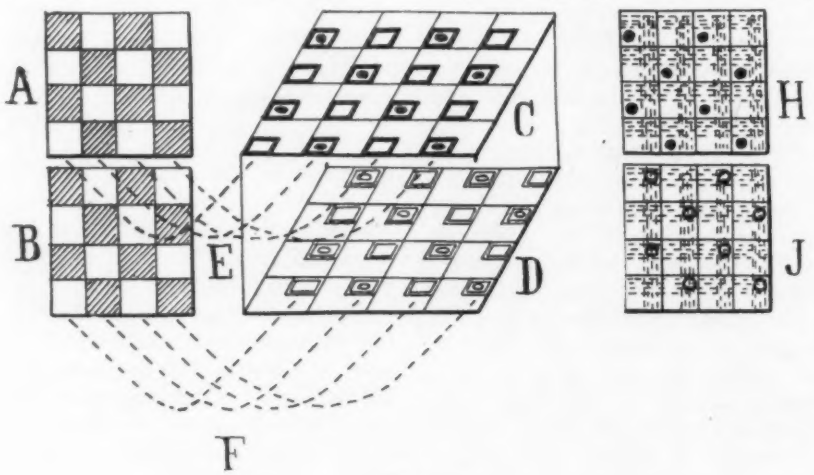


FIG. 4.

clearly marked out in Fig. 4, while dotted lines, E, show, for the first pick of the face cloth where the connection between A and C

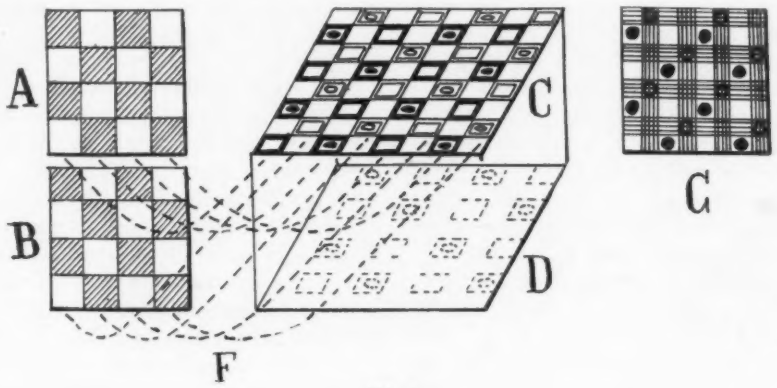


FIG. 5.

comes in. A similar set of dotted lines, F, shows how the first pick of the back cloth, as marked at B, is transferred to the squares of D.

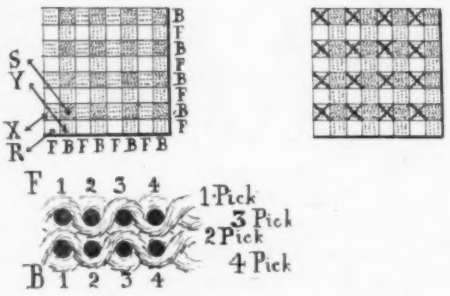


FIG. 6.

FIG. 7.

This may be looked at in still another way. It may be supposed that the designs, A and B, are mounted on some flexible material which stretches only at the divisions between the squares. Such a design when distended would give somewhat similar effects to those produced at C and D, apart from the present distinctive markings of these latter.

By going a stage further, the designs, H and J, illustrate simply another method of representing C and D. In this case the threads in both warp and filling which are allotted to the backing cloth are marked in some way or other, a broken line effect being used in the present instance, although in C are allotted to the face cloth, while the shaded squares, at the points where the broken lines cross each other, are used for the back. These latter correspond with the small outlined squares of D. The warp lift marks are shown by dots in H and by circles in J, while if these two designs could have their unutilized portions obliterated and the squares closed up they would revert to the original plans, A and B.

In Fig. 4 the two fabrics still have sep-

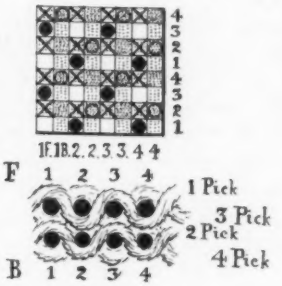


FIG. 8.

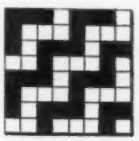


FIG. 9.

arate designs, but in Fig. 5 the markings of the back cloth, D, are projected up alongside the markings of the face cloth. The carrying over of the marks of the first picks of each cloth is again shown by dotted lines, F, and D is at this stage entirely discarded, as both cloths are now represented at C. This marking is also given at G on ordinary

squared paper, the shaded sets of squares again representing the backing cloth.

As mentioned before, however, this design, G, is incomplete, for if put into the loom as it now stands the result would be nothing more than a 3 and 1 twill. The markings in G only answer for the lifts of each cloth when considered singly, but if the two fabrics weave together they must, in some respects, be considered as one, as far as the shedding is concerned. In G, Fig. 5, all the marks represent warp lifts. Although provision has been made for the face ends to lift over the face picks, nothing has been done to show where they lift over the back picks. If one cloth is located over another, its threads are over all the threads of the lower one. Therefore, where there are two plain cloths, unbound as at present, the face warp not only lifts over alternate face picks, but over every back pick.

In the lower portion of Fig. 6 is a cross section of two plain cloths in which this will be at once apparent, while by referring to the prepared point paper above, in which the back thread squares have been stippled, it will be seen how the other portions of the subdivided large squares of C in Fig. 5 are utilized. In Fig. 6 the blank squares, R, are used exclusively for face threads interlacing with face threads, A, Figs. 4 and 5, while the double stippled squares, S, are used exclusively for the intersections of backing threads with backing threads, B, Figs. 4 and 5. The horizontal stippled squares, X, show where the face warp threads cross the back filling threads while the vertical stippled squares, Y, represent the places where the face filling threads cross the back warp threads. A glance at the side of the squares in Fig. 6 shows by the lettering which are face and which are back ends or picks, and if any one warp thread is followed over the series of picks, the reason for the above will be apparent. Where the two cloths are unbound as at present, therefore, the face warp threads must be marked as floating over all the back filling picks as shown by the squares marked with crosses in Fig. 7.

(To be continued.)

Clothiers' Guilds.

Editor Textile World Record:

I would like to have the rules of the London Guild of Clothiers relating to the requirements of finished goods—i. e., to allowable shrinkage, sponging, etc. Dalton (1001).

The name of this guild is unknown in trade and guild circles and rules of the kind named have no place in general practice. In England woolen cloth is bought from the mills with an allowance of one-fourth yard in ten or one-fortieth to cover shrinkage and with an overmeasure of an inch per yard, one-thirty-seventh, to compensate for take-up in cutting. Together the allowances represent a discount of approximately 5 1/8 per cent. to meet contingencies. In some low and cotton warp woolens the allowance against shrinkage is less than one-fortieth, being one yard per piece and thus only one-fiftieth to one-seventieth or less.

Not only is there no present day guild of clothiers discoverable, no trace is found of any guild of the name having existed in London in times past. Various guilds having their origin in textile handicraft survive and the three chief ones are the Clothworkers', Drapers' and Merchant Tailors' Companies. Members of these in the middle ages were all clothiers of some sort and it is highly probable that they issued rules for craftsmen. Certainly the crafts section of the clothworkers in the Elizabethan times sought to enact rules for the control of the mercantile members of their guild. But neither the corporations named nor the Broderers', Dyers', Framework Knitters' nor Weavers' Companies have more than a nominal association with textile trading. Their functions are social and philanthropic. The Clothworkers have rendered great service, however, to textile education. The company spends $85,000 a year on this and secondary education, has built a wing for textile industries at the Yorkshire College, Leeds, at a cost of $350,000, and gives liberal support to other local textile schools. Its hall is in Mincing Lane E. C. James Strand.

THE FIRE RISK OF SHODDY.

BY W. H. SCHRAMM, Bielitz, Austria.

(From Zeitschrift fuer angewandte Chemie.)

One of the leading ocean steamship lines enforces a rule that shoddy shall be carried only on deck; the reason assigned being the danger of spontaneous combustion caused by the grease and vegetable matter in the material. On the other hand other steamship lines carry shoddy in the hold, many years' experience having convinced the officials that there is no special danger from fire in this class of freight. Because of these contrary views a large shipping firm requested the government trade school at Bielitz to give an opinion regarding the fire risk of shoddy. It was clear at the start that any conclusions regarding this question must necessarily be relative and the risk determined by comparison with similar materials, such as raw cotton, grease wool and scoured wool. All of the last named materials are carried in the hold and their behavior during transport is well known. Very little is known regarding the spontaneous combustion of fibers, but the following propositions can be considered as well established:

1. Cotton piece goods, a large surface of which has been saturated with linseed oil, are liable to take fire in the summer time when stored in a dry place.

2. Wadding saturated with oil varnish becomes charred in the interior at ordinary temperatures and takes fire when exposed to the air.

3. Cotton, linen, jute and wool waste saturated with fatty oils takes fire or becomes charred in from 3 to 8 hours when heated to 180° F. and excluded from the outer air.

4. Clean cotton saturated with double its weight of fatty oils heated to 212° F. and exposed to a moderate current of air from the outside often exhibits, after one hour, in the interior of the bale, a marked rise in temperature, varying with the oil used and sometimes reaching the point of combustion.

5. Card waste saturated with oil takes fire very easily when stored in a warm place and protected from the outer air.

6. When cotton is saturated with its own weight of rape oil or cottonseed oil, protected as much as possible against exposure to the outer air and heated to 77° F., the heat generated by oxidation is so slight that the danger of spontaneous combustion under these conditions is very small. With linseed oil the danger is still remote, although increased by the use of boiled oil.

7. Spontaneous combustion has never been observed in the vast quantities of wool stored on the London docks and which have been transported from Australia and the Cape, although packed in large, heavy bales in the raw state, that is in the grease. A temperature of 176° to 194° has been observed in the interior of the bales, but carbonization has not resulted.

8. It seems, however, to be the general opinion that raw cotton is liable to take fire spontaneously. This opinion is in conflict with the results of tests by Kissling, which showed that a higher temperature resulted from wool saturated with linseed oil, than when cotton was so saturated.

From the foregoing it will be clear how the general opinion regarding the fire risk of shoddy arose. Exaggerated ideas have prevailed regarding the amount of grease in shoddy. Such statements as the one found in the Manual of Dyeing by Knecht, Rawson & Loewenthal that shoddy yarn at times contains more than 15 per cent. of its weight of oil have contributed to this belief. Such a large quantity of oil may at times be necessary when working very low stock, but it is for the interest of the manufacturer of the shoddy itself to keep the quantity of oil as small as possible.

For example, a shoddy mill in Biala makes a practice of adding only 5 per cent. of olein to the stock, this being shown by the results of an analysis. In order to reach a basis for investigating the whole question, the quantities of vegetable material and oil were determined in three samples obtained from the above named manufacturer of shoddy. The analysis resulted as follows:

	No. 1	No. 2	No. 3
Water	10.00%	10.32%	9.95%
Fats, soluble in petroleum spirits ..	5.12%	1.00%	5.02%
Vegetable fiber ...	2.30%	8.10%	2.46%

Raw wool, on the other hand, contains from 6 to 21 per cent. of fatty materials, being considerably in excess of the amounts indicated by this analysis. Washed wool should contain from 2 1/2 to 3 1/2 per cent. of fats; worsted yarn, from 2 to 3 per cent. of oil. Raw cotton should not yield more than .4 to .5 per cent. of its weight when treated with petroleum spirits. Foreign wools usually contain a larger quantity of vegetable material than is found in any of these samples of shoddy.

From the foregoing it is evident that the fire risk of shoddy is not greater than with raw wool. The arguments to the contrary are:

1. The rise in temperature resulting from the presence of oil or fat in textile materials depends upon the capacity of the oil for oxidation. The natural fats have a capacity for oxidation inferior to that of the ordinary wool oils. The iodine value of the oil indicates to a certain extent the capacity of that oil for oxidation. The following are the iodine values of various oils:

Wool grease	20/21
Olein	80
Olive oil	82.8
Rape oil	101
Cotton seed oil	108
Linseed oil (not used for oiling wool)	170

2. The amount of heat depends also on the fineness of the fiber. Shoddy, which has been subjected to so many chemical and mechanical processes, is finer than raw wool.

3. The vegetable fibers are likewise finer and more uniformly distributed in shoddy than in raw wool.

As the known facts regarding shoddy were found insufficient to warrant a definite conclusion regarding the fire risk of this material it became necessary to make other experiments. These necessarily consisted of comparative tests of spontaneous combustion. Such tests have already been made with various fibers and oils by Coleman, Kissling, Mackey and Lippert. The work of these experimenters was not conclusive because their tests had been made with a quantity of fat on the fibers, varying widely from the proportions usually found in practice. For example, it is evident that shoddy saturated with its own or double its own weight of fat would exhibit the same tendency to take fire as does wool or cotton under the same conditions and consequently such tests are worthless for our present purpose. It would, therefore, seem necessary to adopt methods of testing that would indicate the variations in the heat generated in materials which contain the quantity of oil or fats ordinarily found in textile materials. Preliminary experiments resulted in the adoption of the simple method of heating the fibers in an ordinary conditioning apparatus. At least 750 grains of the material to be tested was placed in a spherical cage made of tinned iron wire and surrounding the bulb of the thermometer. This basket was placed in the conditioning apparatus with the upper end of the thermometer through an opening in the cover. The temperature in the apparatus was raised to 230° F. before the material was inserted, and kept constant during the test. An extra thermometer was used to insure greater accuracy. Readings of the thermometer were taken at intervals. The details of the various tests were as follows:

COTTON.

Raw cotton containing the normal quantity of fat amounting to .17 per cent. was saturated with varying quantities of olein. The olein was dissolved in petroleum spirits, then applied to the cotton, which was next thoroughly shaken apart so as to insure a uniform distribution of the oil. The material was then spread out and exposed to the air until the petroleum spirit had evaporated. The olein used was obtained from the shoddy mill already mentioned. It consisted of the ordinary commercial product having an iodine value of 81 and containing a small quantity of water and unsaponifiable material. When saturated with 6 per cent. of its weight of olein, the temperature in the interior rose 23°; this maximum being reached in 2 1/2 hours. With 10 per cent. of olein the temperature rose 31° in 2 1/2 hours. Upon opening up the material it was found to have been yellowed in the interior by oxidation of oleic acid. When soaked

with 15 per cent. of olein the temperature rose 66° in 2 1/2 hours, the fiber in the interior acquiring a brown shade. With 20 per cent. the temperature rose 86° in 2 hours. The interior acquired a decidedly brown shade, but no flame resulted when the stock was exposed to the air. With 30 per cent. of olein the temperature rose in 1 1/2 hours from 198° to 425°, an increase of 227°. The material in the center was charred a dark brown. It began to glow when exposed to the air and in a short time burst into a flame. With 60 per cent. of olein the results were similar as those obtained with 30 per cent., but in the former case the stock was charred on the outside, whereas in the latter case the outside was unchanged in spite of the charring of the interior.

It was rather surprising that cotton in its natural state, without the addition of any oil, showed after two hours an increase in temperature of 16° in the interior. Surgical cotton, which was afterwards found to contain .39 per cent. of material soluble in petroleum spirit, exhibited when tested an increase in temperature of 14° at the end of 2 1/2 hours. Raw cotton which had been boiled in petroleum ether three times for three hours, at each time showed an increase in the temperature 16 1/2° in 2 1/2 hours.

These tests disclose the interesting fact that cotton containing from 6 to 10 per cent. of olein and exposed to conditions favorable to spontaneous combustion, behaves in practically the same manner as raw cotton having less than the usual quantity of fat, or with the fatty material entirely removed. As cotton under the normal conditions of transport is never exposed to so high a temperature as 198° F., it may be safely concluded that cotton saturated with 10 per cent. of olein offers no greater fire risk than when in its natural state. Moreover cotton having 15 per cent. of olein cannot be considered as dangerous. The tests were not made with other oils. Drying oils which possess greater capacity for oxidation than does olein are not used in oiling wool. Olive oil possesses practically the same iodine value as olein as regards cotton seed oil. The tests made by Mackey show that the increase in temperature and consequent danger of spontaneous combustion of wadding soaked in double its weight of that oil exposed to a moderate current of air and heated to 100°, is about one-third greater than in the case of olein. This corresponds with the iodine values of the two oils. Cotton soaked with 7 1/2 per cent. cotton seed oil has the same fire risk as the same material having 10 per cent. olein.

WOOL.

Unwashed and very dirty wool from Hungary showed an increase of 22° in five hours. Washed wool boiled three hours in petroleum spirit showed an increase of 11° in three hours. Washed wool with 10 per cent. of olein gave an increase of 22° in three hours. These results indicate that the oxidation of oil is less in wool than in cotton.

SHODDY.

Tests of shoddy were also made with five samples obtained from the storeroom of the shoddy mill at Biala. Stocking shoddy showed an increase in temperature of 11° in 3 1/2 hours. Shoddy dyed red showed an increase of 13° in 3 1/2 hours. Shoddy containing a percentage of cotton showed an increase of 7° in 5 1/2 hours. Foreign zephyr shoddy showed no increase of temperature. Blanket shoddy showed an increase of 18° in three hours.

CONCLUSION.

1. When saturated with 10 per cent. of olein, cotton does not possess any greater tendency to spontaneous combustion than when in its natural condition.

2. Washed wool dried in the air and saturated with 10 per cent. of olein offers no greater fire risk than grease wool.

3. The conclusion from the foregoing is that shoddy containing a proportion of cotton and not more than 10 per cent. of fat of about the same iodine value as olein, offers no greater fire risk than unwashed wool or raw cotton. Tests of various samples of shoddy show even a less fire risk than with grease wool or raw cotton. The foregoing experiments leave little doubt but that the fire risk of shoddy is as low as that of unwashed wool or raw cotton and that shoddy can be stored in the hold of a ship with as great a degree of safety as in the case of the other materials.

ENGLISH NOTES.

(By Our Special Correspondent.)

English textile markets continue to show a sensitiveness to American conditions altogether disproportionate to any loss or recovery of orders from America for textiles. American misfortunes have affected us chiefly via raw materials and finance. Now that America feels herself growing stronger we feel a better tone. It is said with crude accuracy that for nine months nobody has made money. May exports of cotton are down by $8,110,000 and of woolens by $3,760,000 (in comparison with last May). Withal a better confidence inspires the trades.

* * *

As textile machinists and suppliers know to their cost, money rates are extraordinarily high in manufacturing circles, low as bank rate (2 1/2 per cent.) is. Money is tied in trade and even Lancashire concerns which are richer by one-quarter to half a million dollars than two or three years ago postpone payments as often and as long as they can. According to financial prophets, large sums were to be released from trade by this time and to become available for outside investment. It is heartfully wished that even small sums were at liberty to meet due accounts. It must be months before money works loose once more. Meantime the weather is behaving handsomely towards summer stocks, failures are not severe and there is a better faith in the remunerative potentialities of business.

* * *

Linen spinning hours in Belfast are reduced now to 32 per week. Spinners of American cotton are cutting out 117 1/2 hours solidly in six weeks of June and July. Spinners of Egyptian take their own course independently in the matter of hours. As there is no need for forcing outputs, pressure is reduced in most directions and certainly less yarn and less cloth of all sorts are being made. The best worsted and woolen mills feel the pinch as well as the less resourceful ones and buyers of these goods temporize with the subject of orders for next spring. A carpet mill that has been phenomenally successful in the tapestry and Kidderminster trades has broken all its records by closing for ten days at Whitsun.

* * *

Mr. Macara's recapitulation of the work of the International Cotton Congress is an enthusiastic one. He cites the harmony and unanimity of the Federation members, their general concurrence in short time working, the improving organization of the Continental cotton trade, the educational influence of the congressional gatherings, and the $25,000,000 a year that is just about to be saved to users of American cotton. By abolishing the c. i. f. and six contract and substituting a basis of net weight of cotton it is believed that baling methods will be amended perforce. The 6 per cent. allowance for tare stimulates the packer to bring his tare up to that figure and American baling is a by-word. A saving to all concerned is clearly possible by reform, but an approximate $3 per bale to the spinner is a liberal estimate in view of the way in which disadvantages come to be discounted in the process of trading. The calculation seems to assume that sellers will be unable to arrange to get relatively as much for net cotton on a new basis as on the old one.

* * *

A manufacturers' movement towards uniformity in the numbering of yarn counts is nicely under way. It originates with Mr. Jonas Glover, Westfield Mills, Ossett, and its aim is to correlate the woolen with the worsted and the cotton hank. The desire is firstly to simplify matters for the textile student. The Ossett Chamber of Commerce, the Associated Chambers of the Heavy Woolen District and the central examining body—the City and Guilds of London Institute—are all of one mind as to the virtue of uniformity in numbering woolen counts. No one notation has been agreed on yet and probably none will be until representatives of the several woolen areas have conferred with the examining authority in textile education. A system so formulated should have a good chance of general adoption in mill work and that is the ultimate goal.

The question of which unit to accept is under preliminary discussion. The 840 yard (cotton) or 560 yard (worsted) unit are far removed from our yard per dram (256 yds. per lb.). A basis of half of worsted (= 280 = one-third of cotton) commends itself to some. Mr. Glover would like a unit more easily convertible with pounds, ounces and drams, but multiples of 16 are out of exact harmony with the established standards for cotton and worsted and it is in no case likely that these standards will give way. The matter awaits decision by the combined wisdom of users of the several local woolen counting systems.

* * *

Manifold difficulties beset the organizer of the International Federation of Textile Workers. There are differences as to objects between the revolutionary Continental delegates and the Lancashire men who keep business consideration and sentiment in separate compartments. There are differences as to means, for the Continental unions are poor and the Italians are unable to pay this year even the small levy which Lancashire deems inadequate to make the Federation the living force it might become.

The Federation has members in nine countries and is representative of 434,300 operatives. Of these 200,000 are English and 120,000 German. By dint of numbers and wealth the English contrive to get some of their own way. The business basis of the union lies in the Continental desire to get English hours and wages and the English desire to put an end to cheap competition abroad. The Federation would be all the more effective were it able to give more support to authorized strikes. It lacks money and can accumulate funds only gradually. However, its influence is gently encouraging and its Continental branches report shorter hours on an average and better wages than three years ago. Leveling-up is approved theoretically on all hands and it is improbable that any section of the trades would lose from an all round amelioration of working conditions.

* * *

A bad blunder by the Department of Agriculture of the Orange River Colony is likely to call for some undoing. The Department prescribes as a dip to prevent sheep-scale a compound of caustic soda and sulphur. Really this is committing suicide in order to save life. The soda denatures the wool, the sulphur tends always to stain it. As there are several compounds quite as serviceable as this from the veterinarian's view and entirely unobjectionable from the manufacturers', the error is very unfortunate. It is all the less excusable because an orderly body of scientific evidence on the subject of sheep-dips was published by the British Board of Agriculture in 1904.

* * *

Medical observation suggests that the persons most susceptible to anthrax poisoning are individuals new to the work. Whether this is because newcomers are most nervous on the point or most careless is not clear. It is certain that blood-stained wool and hair and that with portions of the pelt adhering are riskiest. Of 59 blood-stained suspected samples examined by Dr. Eurich in Bradford lately, 8 conveyed the anthrax germ. The contamination has been found in one sample of a shoddy blend but such an instance is exceptional.

* * *

One effect of the new Patents Act in bringing new industries into England has been to whet local appetites for more industries still. Thus Bradford is to see what can be done to bring French firms into its midst. From 60 to 80 million yards of French dress-stuff, chiefly plain-dyed and carded from short merino, are consumed annually in this country. Relatively to Lancashire wages Bradford wages are low and taxation is high, but water is cheap and waste waters may be passed away free. Bradford firms took woolcombing and luster stuff weaving to France. It is still a question whether French firms will take the art of soft stuffmaking to Bradford. English attempts to copy Roubaix fabrics bring in stuff too dear for the bulk trade and when the French price has been approximately matched the goods have been dismally shabby.

* * *

It is a new departure in the worsted trade

to give operatives airy dining rooms with polished floors, painted walls, palms and ferns and Chinese lanterns. It is new also to provide good servings of mutton and potatoes for 10 cents and potato pie for 6 cents. The ordinary mess-room is as bare as a prison and the food comes in cans and parcels from home. Reuben Gaunt & Sons, Ltd., of Farsley, Leeds, make the innovation and from business motives. They want the best work and the best workers and to get them are prepared to pay rent and rates on a well-fitted kitchen and series of dining halls and to organize a system of meals at cost price, cooked by experts.

* * *

The recent experiences of the great combines have largely been unpleasant. In three months of 1908 the Bleachers' Association has receded $95,000 in profits. Distributing 3 per cent. on ordinary stock, it is explained that dear coal and chemicals, collapsed demand and the persistence of old contracts at inadequate prices for work are responsible. Dear wool is blamed again by the British Cotton & Wool Dyers' (or Slubbers') Association. The carry-over from 1906-7 brings up its dividend to 2 per cent. There was a loss of $30,000 on the realization of its American mercerizing and dyeing plant. There were losses on the cotton yarn merchanted by the Association. Diminished turnover with the high cost of consumable stores left a net profit of only $85,000.

* * *

The Fine Spinners, their pockets bulging with a dividend of 12 per cent., after paying lavish appropriations, say nothing of dear coals. They own a fine colliery which has been lucrative to them. Coalpits have not been invariably so to textile manufacturers, nor have such other auxiliary ventures as ownership of merchant houses. But this cottonspinning combine has in all respects done well and the fact that it is receiving a marked increase of business, albeit at low margins, is an auspicious sign for the cotton trade as a whole.

FINISHING WORSTED TOP.

BY JOHN BROWN.

The object of this article is to point out a few of the matters which affect the finishing of worsted tops. Some of them may seem small, but if overlooked, they tend to produce unsatisfactory results.

By finishing is meant every process after the fibers have actually passed through the pins of the combing machine. It applies to all classes of wool generally, but to the finer classes more particularly. Whatever class of wool is used, a carefully finished top will always have the preference as a marketable commodity. It is necessary, in order to get the best results, and to put a smart looking top on the market, not only to make sure that it is well combed, i. e., freed from all knots, neps, burrs, etc., and the fibers all laid parallel, but also that the sliver should be even, ribbonlike and (without twisting), leaving the top, when it comes to the drawing process without clicking or fraying of the edges.

After seeing that the pin work is in good order, circles truly set, and wool well put in, to ensure a clean combed sliver, the leather sheets on draw-off rollers demand attention. When these become slightly worn and the sliver draws off with a curly edge, or if there is a tendency to cut the fiber, they should at once be replaced. There is no economy in running the sheets after they cease to draw a continuously even sliver. If the addition of a little weight to pressure springs does not effect this, the sheet should at once be discarded.

Sometimes an evenly drawn sliver when leaving the tin in which it has been coiled, will show in places a single fiber wrapped round the sliver. This is generally caused by some little roughness in the delivery plate of coiler. This can be remedied by working out the dent with a very smooth file. Inattention to this means broken fibers in passing through gill.

Again, the tins into which the sliver is coiled should be frequently examined to see that there are no jagged edges to tear or break the sliver.

For fine, tender wools it is best to have a creel fastened to the first finisher, large enough to overhang the whole range of tins, with rollers over every row of tins. These assist the slivers and can easily be driven by gear from back roller of finishing box.

The guides in creeper plate should be so

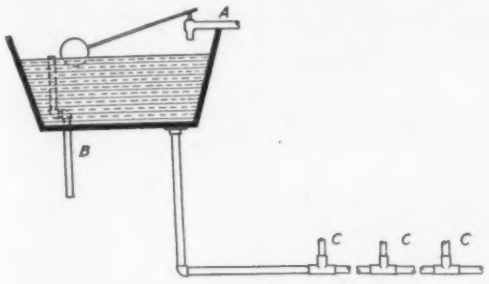


FIG. 1.

set as to deliver one inch narrower than the pinned-over part of fallers.

The back or feeding rollers, when properly set, should be at least 1/4 inch higher than bottom of pins in faller, as should also the front rollers. Much bad work is caused by front rollers drawing downwards from gills, and the same evil obtains if the slivers are dragged in an upward direction in taking the wool as delivered by back roller. If the rollers are too low, they can be easily adjusted by putting a metal packing under the brass bearings, raising rollers to required level.

Draft is the ratio between the length drawn by the front roller and the length delivered by the back roller in a given time, whether it be in inches, feet or yards. Thus if one yard delivered by back rollers is drawn out to six yards by front rollers—the box has a draft of six.

All wool of the same average length will not stand the same draft. While it is advisable to use about as long a draft as the wool will stand, great care must be taken not to overdraft, otherwise the sliver will be uneven. This is easily detected by holding up the opened sliver to the light, when the thin places are plainly seen.

If too short a draft is used the sliver although not as uneven has a pushy appearance; the fibers do not lay well, and instead of the clear appearance of a well drawn sliver, it has a muddy look.

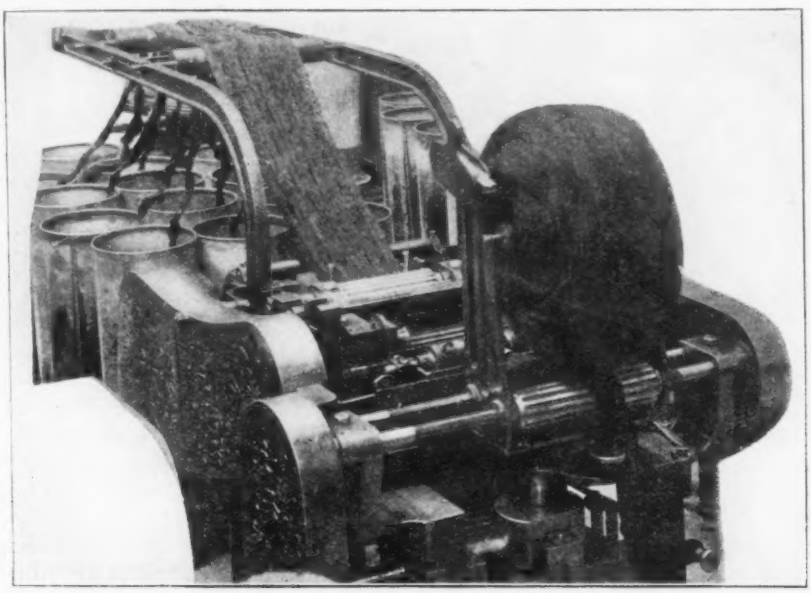


FIG. 2.

Apart from the draft between front and back rollers, the draft between back roller and faller has to be considered.

The fallers should have just enough lead

to secure the slivers being well laid into them, traveling say about 1 1/10 inches while back roller delivers 1 inch. There is no arbitrary rule for the draft as loose, fluffy sorts require rather more draft on faller than the longer and straighter qualities.

The pins in the fallers should be carefully looked after and kept in the best of repair. Even with the best classes of wool waste accumulates between the pins and should be regularly cleaned out. If not, there is not only a tendency to irregular drawing, but bits of the waste will be caught by the front roller and if mixed with the sliver, will spoil it.

Blunt or split pins in the fallers detach fibers from the body of the sliver passing through the gill. On coming to front roller the loose fibers are rolled rather than drawn, and show badly when the sliver is closely examined. When putting new leather sheets on front rollers care must be used to put no more pressure on than is absolutely required.

In the case of dead-weighting the weights should be moved along the levers a little at a time and as soon as the rollers draw a nice free sliver no additional weight should be used, until required by the natural wearing of the leather.

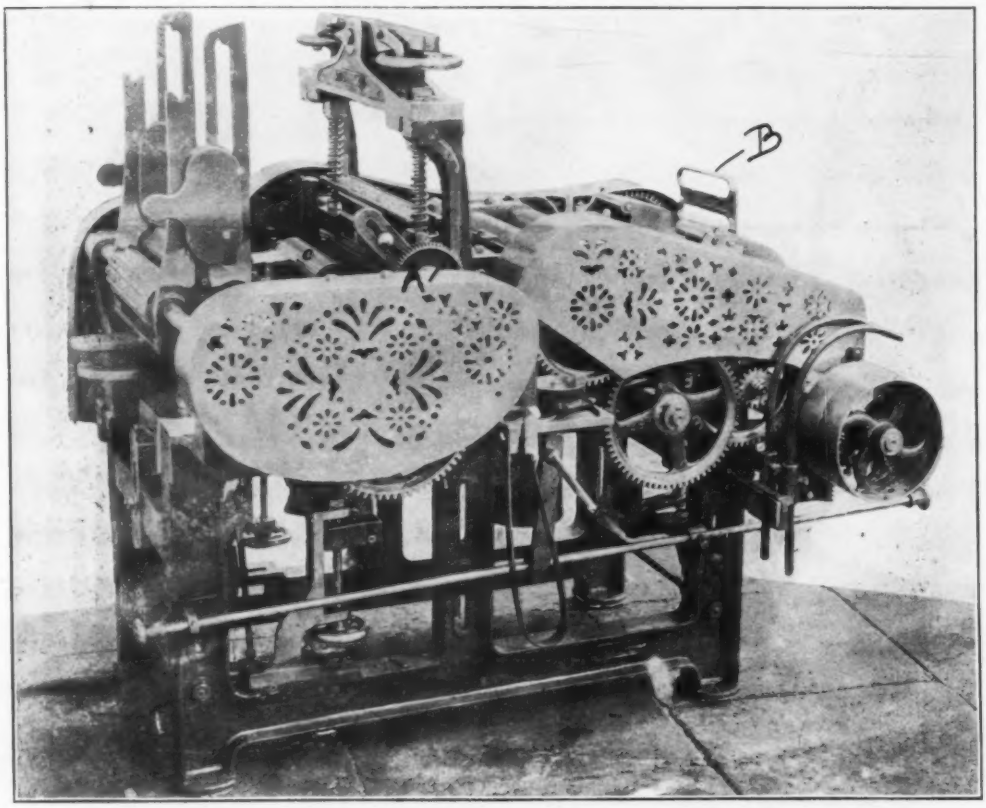


FIG. 3.

Where spiral springs are used the pressure should be increased in the same gradual way.

It is when the sliver has left the front rollers of the first finisher that moisture is added to make up for evaporation during the combing process.

It is advisable to have the first finishers 1 set in a straight line, and at the same level. Thus a range of 8, 10, or even more boxes can be fed from one tank of water. At the

end of the row of boxes the feed cistern, with ball and stopcock feed, should be fixed. The pipe from this can be taken at or below the floor level and the troughs at the various boxes kept supplied by upright pipes.

The advantage of this method is, that, although every box can be geared for any desired amount of moistening, yet by having a regulating overflow in feed cistern, the water level in all the boxes can be raised at once, without having to touch the gear in the case of a sudden rise of temperature.

Fig. 1 shows a simple moistening device, the swinging of the overflow pipe altering

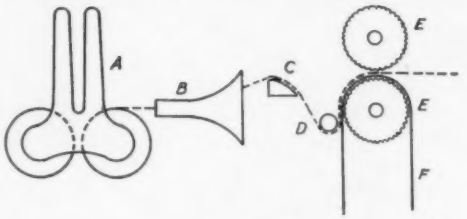


FIG. 4

the water level at once.

The dampening roller should in all cases be made of brass to prevent rust, and be geared to the front roller in such a way as to be easily altered when required.

Figs. 2 and 3 show complete finishers. Both have moistening rollers, C, as some prefer to add moisture at the first process and others at the second.

It is preferable to moisten the top in the first process, as the roller only dampens one side of the sliver in any case. If this is done in the first box the moisture gets well blended with fibers in passing through the second gill.

The following is the standard for moisture allowed, which is most generally recognized:

Tops combed in oil, a regain of 19 per cent.

Tops combed without oil, a regain of 18 1/4 per cent.

The gear for increasing or reducing speed of moistening roller is shown at A, Fig. 3.

B, Fig. 3, shows the double guide through which the slivers from the first box are fed to the second back roller.

It is preferable to make the slivers from the first gill of such a weight that only two will be required to feed the second. Then by using the double guide the slivers are laid flat, one upon the other. This prevents the wild appearance which tops show at times when the slivers are fed side by side, and especially if a number of light slivers are fed instead of two heavy ones.

The same remarks apply to the second finisher as to first as regards the guides being narrower than bed of fallers, draft, pressure and care of leather sheet.

After the sliver has passed through front rollers in second finisher, another important point crops up, i. e., the folding of the edges of the sliver before finally passing and forming part of the top. In cases where the tops have to be taken to drawing soon after combing much waste is likely to be made if this is not attended to. Various contrivances have been tried to overcome this difficulty, among them being revolving funnels, in some instances scored with a file, but this wraps one edge under and the other over the sliver and is apt to roughen the sliver as in the case of the coiler, already mentioned. Others have tried fixed funnels with triangular instead of circular holes. Another fairly successful method is to dispense with the funnel altogether and pass the sliver through a flat grid with folding bar set at an angle. About the best contrivance is the one known as Shaw's folder, in which the sliver passes over a broad bar whose surface is a section of a circle and is set well above the funnel, Fig. 4. The sliver on leaving this bar has both its edges folded under by passing through the funnel. The edges meet in the centre of the sliver and are always on outside of the top. Thus the next layer has its solid side pressed on this, and when the tops come to be used in drawing, the edges of the sliver are in no danger of fraying, clicking, or causing breakage of the sliver or undue waste.

All tops which have to be packed should be neatly wrapped in brown or white packing paper, so that no dust or any foreign matter can get on them.

Just a word as to thickness or weight of sliver. Many complaints have been made by spinners who get their tops from various sources, about the varying weights received from different firms, making it difficult to get their blends equal.

Although there is no real standard, the following are those more generally used and which are recommended by the Bradford Chamber of Commerce.

Prepared tops	7½	ozs. per 10 yds.
Carded Crossbred tops	6	ozs. per 10 yds.
Botany tops	4	ozs. per 10 yds.

THE OBJECTIVE POINT OF CARDING.

BY RICHFIELD.

While in charge of a woolen card room I was approached one day by the vice president of the company, a young man of very limited experience in the woolen business, but who was going through the mill getting a general knowledge of the work, and who by reason of his being a brother of the president and general manager of the company had full scope to learn as much as he could and in any way he chose. Our conversation this day ran along general lines and in the course of the same he called me by name and said

"Men in all branches of business and all mechanics have or should have some watchword, some objective point in view. The business man who has something to sell has publicity for an objective point, and seeks through the medium of advertising and square dealing to gain that point. The carpenter's objective is the square and plumb, and the same with a great many other branches of mechanics. What then is the objective point of wool carding?

I replied at once:

"Parallelism of fibers."

"Where does it really commence?"

"At the drier if it is a machine drier and equipped with a Bramwell feed, as the straightening process undoubtedly commences at the comb on the drier feed and ends at the ring doffers on the finisher card."

I further pointed out to him that though parallelism of fibers was our objective point, it was only possible up to a certain point on woolen cards, in fact only desirable up to a certain point. If we go beyond that and get our thread too smooth and straight we lose the nap which is necessary on certain kinds of woolen cloth. Do our best, this is not possible on woolen cards. No matter how well the stock is carded and straightened after passing the several carding points, they are more or less crossed again after passing the fancy.

I then pointed out to him the part the picker plays in helping us along toward the objective point. The picker should be equipped with the proper feed rolls that will grip and hold the stock while it is being combed, opened out and mixed by the teeth of the cylinder. To get the best results there should be two pairs of rolls preferably with cock spur teeth, as they are self cleaning. The pair next to the cylinder should run slightly faster than the forward pair, as this not only keeps the space clear between the two sets of rolls, but draws and straightens out the stock considerably before it is acted upon by the cylinder teeth. These, in order to do their part and complete the picking process, should be sharp and round at the point and not sharp and flat—chisel points—as is the case with a great many old and neglected pickers. The latter cuts, breaks and mangles the fibers to a very great extent besides mixing them imperfectly. In some cases it renders the stock entirely unfit for the sizes of yarn for which it was intended. If the above rules are observed the picker will do its share of the work and the cards will not have to do the work of both.

The cards are excellent machines for the work for which they are intended, for straightening, mixing, blending and condensing the stock into soft threads or strands of roving for spinning, but they make poor pickers. At any rate they are very expensive pickers to maintain, and were never known to do both kinds of work satisfactorily. The carding machine takes all the delicate fibers, in a crossed up, jumbled condition, straightening and combing them out and drawing them down to a fine level thread of any length, with practically no limit, and with the least possible injury to the fiber, to be then spun and eventually woven into cloth of any color, design or thickness. This is not all; this straightening and combing process is supplemented by one of the finest and most perfect mixing and blending processes known. The card com-

bines combing, straightening, mixing and blending.

There are two things about a set of cards that are the proverbial thorns in its side. These are the fancy and tube, especially if the latter is run at a very high speed, as the stock after leaving the breaker doffer is crossed up again and twisted in proportion to the speed at which it is being run. The fancy and tube are two necessary evils that will have to stay until something better is invented to take their places.

A CLEARER FOR PREPARING FRAMES.

This clearer, invented in England, has recently been patented in this country and is described by the inventor as follows:

It is designed to provide a more efficient clearer for the rollers of preparing machines employed in the preparing of textile fibers for spinning. These clearers are affixed to the inside of a cover which is hinged to cover the rollers so that when the cover is raised the clearers are at the same time removed from the rollers. Hitherto they have been made by fastening a strip of cloth in an endless band over two rods or bars or by pivoting two cloth covered rollers to suitable brackets. The former is objectionable in that the fly or fluff collected from the rollers forms in lumps on the surface and the latter is objectionable in that the fly or fluff collects around the pivot of the rollers and retards or stops their rotation.

This invention consists essentially in constructing the clearer of a cloth covered roller or rollers so attached to the cover as to rest loosely on the drawing rollers and at the same time to be lifted with the cover when it is raised.

Fig. 1 is a cross section, showing the cover raised and the clearers lifted from the rollers. Brackets are adjusted inside the cover, and provided with pins projecting inwardly. The clearers are cylindrical and each formed of a tube or of a roller with tubular ends, which are open and much wider than the diameter of the pins. The ends of the hollow or tubular clearers are placed over the pins, which are very much less in diameter than the interior of the tube or roller. The pins are in no sense pivots, as the clearer rollers, D, revolve upon the drawing rollers altogether independent of them and their only function is to raise the clearer rollers with the cover. As the pins are stationary, fly or fluff is not liable to accumulate upon them, but should such be the case it will not interfere with the rotation of the rollers as is the case when mounted upon pivots. Instead of pins at the ends rods may run through the tubular clearer.

If desired to give to the clearer a longitudinal movement as it rotates, the ends may be made inclined, scroll shaped or otherwise. As the clearer rotates the one end will first press against the bracket while the other end is below the bracket

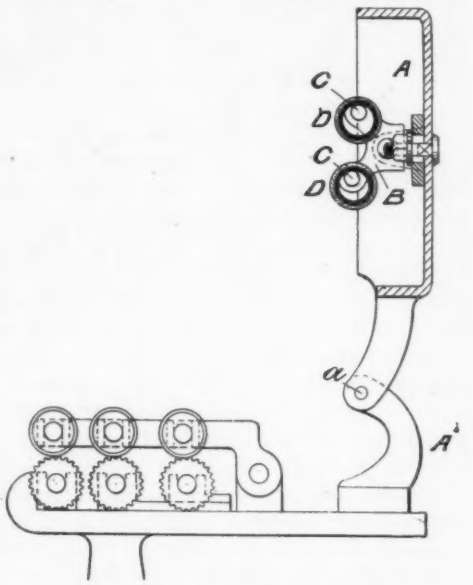


FIG. 1.

and move the clearer in one direction; then the other end will engage its bracket and move the clearer back again. This construction allows the clearer to rotate freely upon the drawing rollers without contact with a pin or pivot while providing means for lifting the clearers with the roller cover. It also allows the clearers to accommodate themselves to a resetting of the drawing rollers without requiring to be reset.

Questions and Answers

Under this head we undertake to answer, free of charge, to the best of our ability, any pertinent inquiry pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD RECORD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring ,not for publication, but as an evidence of good faith.

For reply to questions that are not of general interest to readers of textile journals, such as those relating to the composition of yarns, analysis of fabrics, etc., we will charge the enquirer with the cost of the investigation.

Mercerizing Single Yarns.

Editor Textile World Record:

Are single yarns ever mercerized?

Ashton (999).

Single yarns can be and are mercerized and while a very good gloss can be obtained, the best results are produced on two-ply yarn. The yarns should not be stretched while being immersed in the caustic soda solution, but stretched during the washing off immediately after leaving the mercerizing bath. Peterson.

In order to get a satisfactory reply to this question the writer has been weighing and breaking yarns for 20 days. We have in our mill yarns from 3s to 95s, but the yarn I have been watching has been 21s warp. I have found that the yarn has varied only half a number. I do not know why the correspondent should say "undyed" yarn unless he wishes to know what count he should spin to have the yarn come out a 10s yarn after it has been dyed. If this is the reason, he should spin as near to a 9 1/2 yarn as possible and then he will find that he will have a variation of about half a number. A great deal depends on how well the roving has been prepared for the yarn. Good, even carding, drawing and slubbing will go a great ways in getting a good even yarn. The condition of the roving from day to day will make a great variation in the yarn. It makes no difference whether the yarn is dyed or undyed, the variation will be the same, that is, about half a number. One day it might be 10.25, another day 9.75 or even 9.50. If single roving is used there will be a greater variation than with the double roving.

Among the many causes for variation in yarn are long and short staple cotton, poor mixing, bad carding, uneven drawing, etc., all of which make it very difficult for the spinner to spin a yarn that will be 10s, 20s or 30s all the time. Gamaliel Gaunt.

There is very little difference in the manufacturing of hosiery, either in the natural or the dyed yarn. The way the work runs depends upon what class of yarn is used and whether it is properly twisted and softened. Anyone buying mercerized yarn will find it very difficult to get yarn to run well on the machine. I have found by rewinding and using the following softener that the yarn will run much better:

8 lbs. olive oil soap;
1 gal. lard oil (bleached);
1 lb. sal soda;
Add 5 gal. water. Boil for one-half hour and then add water to make 20 gallons.

A tin or wooden roll driven from belt on winder shaft is immersed in a trough filled with the softener and extending the length of the winder. The roll is revolved slowly. The slower the roll revolves the less softener it feeds to the yarn. The roll should run in the opposite direction to that of the yarn. I have used this device on cotton and woolen yarns for a number of years and always found it satisfactory. It is better to make hosiery in the grey and dye in the goods, as this gives a much better fabric. The twist should be soft hosiery twist, both in the single before twisting and in the ply after twisting. In this way better results are obtained in mercerizing and the yarn runs much better on the machines. I have mercerized single yarns from 8s to 60s with very good results, but it is very slow work and costs double the price of ply yarns.

Crawford.

In making hosiery from mercerized yarn the best method is to knit it in the natural

and dye the goods after. Dyed yarns are usually harsh and causes more defects in the knitting and do not take as good a finish as when the goods are dyed after knitting. Single twisted yarns can be mercerized. The twist can be as soft as any other hosiery yarn, in fact a hard twisted mercerized yarn does not show the lustre as well as a soft twist. In knitting mercerized yarn very close attention should be given to the tension on the yarn and gauging the stitch on the machine. Profile.

Streaks in Cotton Fabrics.

Editor Textile World Record:

We are anxious to know whether there is any chemical which we can use in connection with wetting cotton fabrics, particularly those made from natural American cotton, which will prevent the fabrics from streaking when lying in a wet state. In a certain process we find it advisable to wet certain fabrics without washing them and it is sometimes necessary to leave them in a wet state for several hours. We find that where they lie in piles in this condition they are apt to become streaked or turn yellow in spots, particularly so in fabrics made from natural yarns which have not been processed in any way. It occurred to us that there was some chemical that could be added to the water in wetting these fabrics, which would overcome the tendency mentioned above, but we have been unable to get any information along this line. These goods referred to are not washed, but simply wet. We have a method of forcing the water through the goods that wets them thoroughly and extracts the water immediately, so that it is not possible for us to use any method of preventing streaking, which would ordinarily be adapted to goods which were being put through a regular washing process. It occurred to us that we might use some chemical in the water which we force through these goods, which would have a tendency to kill the streaking effect of the natural oil in the cotton, as we take it for granted that the streaking comes from this cause.

We enclose sample of the goods which shows the trouble that we are trying to correct. The process of wetting and extracting the water from these goods is now a very simple and expeditious one and if possible we want to find some simple method of adding something to the water to overcome this difficultv. Clinton (996).

It is very evident that the objectionable stains complained of are, as stated by your correspondent the result of vegetable oil from the cotton seeds, present in the yarn.

Replying to the specific point raised by your correspondent as to whether or not there is some chemical that could be used in the water for the wetting out process to prevent such stains, it is very probable that he will find the relief sought, by mechanical rather than by chemical means. I don't know of any such agent and doubt very much if there is anything that would find practical application for this purpose.

It is commonly known that cotton in the natural state is very impervious to water, and therefore difficult to thoroughly wet out with water alone, except at a high temperature, or when under pressure. Such high temperature and pressure, while wetting out the cotton more rapidly and thoroughly, at the same time have a softening influence on the cotton. The crude oil frequently bleeds into the layers of cloth with which it comes into immediate contact. The substance causing such a stain is very susceptible to atmospheric influence, and if left in the wet state, even for a comparatively short time in piles exposed to the atmosphere, will rapidly oxidize and form permanent brownish stains.

In the absence of any information as to the mechanical method employed by "Clinton" for wetting out his goods, the elimination of the trouble would seem to be along the following lines: First, maintaining as low a temperature of the bath as possible. Second, avoid passing the material through squeeze rolls or wringing machine for the purpose of extracting the superfluous water. To carry out the first suggestion, "Clinton" can use about 3 per cent. of soluble oil in the wetting out bath, which will aid the impregnation. For carrying out the second suggestion we would use a hydro-extractor for getting rid of the superfluous water.

When a batch of goods has of necessity or unavoidably to be left for a considerable time in the wet state, the writer has frequently found it a very good practice to cover the goods with wet cloths, to prevent partial drying out at the outer surfaces of the batch, which would invariably cause streaks or stains.

As a remedy for the trouble, after it has occurred, the following treatment will in most cases enable the manufacturer to market the stained goods as firsts. The stained goods to be treated are first boiled in a bath made up with 4 to 5 per cent. sal soda, boiled for 30 minutes. The water is

then run off and the goods thoroughly rinsed in cold water. The bath is again made up with 2 per cent. sulphuric acid, and 2 per cent. muriatic acid, heated to 120° F. The goods are handled in this bath for 30 minutes, then thoroughly rinsed in three successive waters, the first two cold, and the last heated to 110° to 120°. The warm bath is for the purpose of removing all traces of acids. It is usually advisable to supplement this treatment by giving the goods a light soaping, using 2 per cent. of soap, raising the temperature to 130°. The goods may be taken direct from this bath, extracted and dried. Palmetto.

It is not necessary to use any chemical on the goods. If "Clinton" will watch his work he will find that the streaks or stains will be more noticeable on a hot day than on a cold day and that they seem to appear more on the natural yarns that have not been scoured or bleached than on goods that have had all the dirt taken out of them. These stains are what is generally called air stains. They are caused by the action of the air on the moistened goods and are due to a chemical change which takes place in the goods as the moisture evaporates. As the goods dry up the air stain is formed and will always be found around the elges of the piles or in any place that is left exposed to the air. The stains will occur in any kind of cotton goods that are left in a wet state for any length of time, but they will appear quicker in goods that are in the natural state. This difficulty will appear in goods that have had all the oil extracted from them.

It would be well for "Clinton" to have a stage 8 or 9 inches high to pile his goods on. After they are piled on the stage, with none hanging over the sides, cover them over with a cotton sheet and bind the corners as tight as possible. Over this sheet throw a waterproof covering and let a spray of cold water fall continuously on the covers to keep the goods cold and wet. It is not necessary to have a certain amount of moisture in the goods before drying. An ordinary garden can with a fine rose spray could be used. Fill the can with boiling water and spray. "Clinton" can leave the goods exposed until required, as the boiling water sprayed in this manner will remove the stains in a very short time. After the stains are gone he can then proceed in the usual manner until the goods are finished.

If "Clinton" wants to get his goods whiter I can give him a formula for a mixture and he can mix the chemical himself to use on the goods without fear of injury to the cotton and which will make the goods softer and whiter, but it might mean his giving the goods an extra run or so. The stains in the sample submitted were removed by immersing into boiling water, left 15 minutes and then dried. Dulcimer.

There is no chemical that will prevent the yellow stains and there is no way to remove them except by bleaching. "Clinton" states that the goods lie in the wet state for several hours and that this causes the stain. This I doubt very much. The process to which "Clinton" refers is simply the wetting out of the knit underwear and then extracting the surplus water so that the garment will shape and board better. I have seen thousands of dozens of garments knit from American and Egyptian cottons and I have never known or heard of a single garment being stained or streaked. The stain in the sample sent me must have been caused by the garment having remained many hours in a wet state. If this is the cause of the stains, and I believe that it is, wet the garments out only as fast as they can be boarded. Do not let the garments lie over night and do not let them lie in a hot place. Chemicals are costly and also dangerous to use on cotton goods that are going into drying closets.

Baumwolle.

Regarding Crepes.

Editor Textile World Record:

What is the best way to handle goods, like the enclosed samples, in the soaping and bleaching process? The cloth has a silk warp, and cotton crepe yarn filling, and measures 27 inches in the grey. The goods must finish 23 inches wide. The swatch marked "one hole" was creped and soaped in boiling soap liquor, and also bleached in open width, the piece being folded and thus immersed in soaping and bleaching liquors. The result is otherwise good except that it measures 26 inches instead of 23 inches. A piece soaped on a jig

gave similar results. The piece marked "two holes" was soaped and bleached in rope form. The lines made by the cockling of the filling will not come out, although it finished the required width. Dexter (1000).

Crepes must be handled just right if satisfactory merchandise is to be looked for. The fabric to which this inquiry refers is a cheap quality of crepe de chine. The warp in the reed has 90 ends per inch of yellow Italian raw silk of a heavy size, about 24/26 deniers. The filling has 72 picks per inch of single cotton yarn, running alternately two picks of right hand twist and then two picks of left hand twist, one of the twists being tinted a light color to distinguish it from the other, which is in line with the regular practice. The size may be about 1/40, but, because of the extra twist given it, it may have varied much in size from its original count.

It is this weaving with alternate right and left hand twists that gives the crinkle to crepe de chines. They can be made pick and pick, two and two, three and three, etc., but the two and two arrangement is most satisfactory. The torque of the two twists, working against each other, produces the desired effect. If only one twist were used a crepon would be the result. Two by one box looms are much used for crepe weaving. Some crepes, of course, are made by a crushing or hot pressing process, but with these we are not concerned at present. There is nothing special about the warps of crepe de chine except that the material must be strong and weave well. Heavy sizes of raw silk are used, single or double, and tram is also used for warp. With such material looms can be run quite fast. If the grege is used it should not be soaked, but should be wound dry from the skein, so that the natural gum which envelops the silk will not be disturbed.

When silk filling is used Canton silk is generally selected, as it is cheaper, and its natural hairiness disappears in the very hard twisting that it receives. Three or more of 14/16 denier Canton will be doubled together and then receive a very hard twisting, about 70 turns per inch. In throwing silks into this hard twist, there is more waste made than would ordinarily be the case, say about 5 per cent., and there is a very distinct take up in length in the twisting to be reckoned with. Careful tests show that for a Canton silk of four drams in size 70 turns of twist per inch will reduce its original length 16 per cent., while, for the same twist, a Japan silk of 4 1/4 drams takes up 19 per cent. The Japan silk is harder in its nature than the Canton. This same size of Japan in 48 turns loses 12 per cent.; in 32 turns, 6 per cent.; and in 16 turns, 1 per cent. An experienced hard-twist throwster gives the following figures: For 4, 5 and 6-thread tram: 45 turns, 10 per cent.; 50/55 turns, 15 per cent.; 65/70 turns, 4 thread, 20 per cent.; 5 thread, 22 per cent.; 6 thread, 25 per cent.

Some tests on a 1/60s (cotton count), spun silk, where additional twist was added to the twist put in the yarn in its original spinning, resulted as follows: 16 turns extra twist, 2 1/4 per cent. loss; 32 turns, 5 1/2 per cent. loss; 48 turns, 13 per cent. loss. These figures will show the importance of this point when figuring out costs. Coarse yarns take up more twisting than fine ones.

The more twist that a filling has the greater is the tendency to contract. In determining the relations between the width of the cloth in the loom and the finished width this must be well considered. Hard twisting is expensive. For instance, a 5-thread silk filling with 70 turns may cost, to throw, $1.60 a pound, while if made with 45 turns the price might be $1.20 a pound. A manufacturer trying to save money by cutting down his twist may find that with the slacker twist the desired effect is not obtained.

It is fair to infer that the main trouble in getting such cheap cotton filled crepes down to a desired width has been due to the lack of sufficient twist in the filling, and consequently the cloth will not give the shrinkage wanted.

It may also be mentioned that yarns which are hard twisted and have been made for some time, lying wound on bobbins for weeks and perhaps months, get set, and when made into goods the twist do not respond by crinkling up as they would when freshly twisted. This would not be as much the case with silk, as the boiling out of the yarn allows the twist of the silk a free course, but for other fibers it would be the case to a greater or less extent. Some influence of

this kind may perhaps be also at work where the goods will not shrink in as they should.

Crepes should pass through the discharging and bleaching baths in open width and never in rope form. Great care should be taken that no part of the apparatus rubs or chafes the goods, that the cloth rub against itself as little as possible, and that the dye house hands are taught to handle the goods very carefully. Rough or careless handling or pulling will certainly produce chafe marks that are such a serious, expensive and common defect in crepes. These whitish marks, which show up in certain lights, are caused by a displacement of the fiber when the goods are in the wet state, and once made there is no cure for them.

Some similar marks can be caused by the presence of lime, either in the water or in the silk itself. In such a case a bath with a little hydrochloric acid in, and a subsequent bath in a weak soda solution to neutralize it, followed by a good washing, will correct this difficulty.

Methods for boiling off the gum of the silk, and for the bleaching of the cloth, are well known to dyers and printers, and information on these matters can be easily obtained. Note, however, that the silk should not be allowed to boil. A temperature of 195° to 205° F. is about right for the boil-off bath. This bath should be made with good olive oil soap of a weight equal to about one-third of the weight of the silk that is to be discharged.

While in process these goods should not be allowed to dry out, and to get the best results they should always be finished on a tentering frame, which not only brings them out to an exact width but leaves them with a richness of touch not to be attained in any other way.

The big automatic tentering frames are extremely costly and bulky, use much floor space, steam and power, and but few mills have them.

A simple and very useful tenter can be made as follows: A long frame on legs is provided, with pins, or clamps, at the sides, in which the selvages of the pieces can be clamped while yet damp or wet. The sides of the frame are arranged so that they can be moved away from each other so as to stretch out the fabric to exactly its required width. Fifteen or twenty feet is a convenient length for the apparatus.

Under the machine, and lengthways of the frame, are laid a couple of tracks. On them moves a sheet-iron box or pan, a couple of feet square and mounted on wheels. In this pan is burning charcoal. The operator moves it backward and forward under the goods till the length being treated is dry, taking great care not to scorch the fabric, which it is easy to do. To accomplish this drying the man stands at the end of the frame and gives the car a push down the track. It is brought up at the end of its travel by a cord attached to the carriage and the operator pulls it back to him. When this length of cloth is dry the car is drawn out beyond the frame, the clamps are opened, the dry cloth wound up, the next length of damp cloth is clamped in and spread out, and the process is repeated. Primitive as it may seem, a man, with a boy to help him, will get through a very respectable quantity of goods in a day and they will be really well finished, though, of course, it would require a number of such frames to handle a large product. The big 60 to 90 foot frames will cost, with their engines, from $3,000 to $6,000 each, and they take up a lot of room. While very economical as to labor cost of output, they eat up quite a lot of money in interest, depreciation, rent, and steam, and only a large product to be handled would justify the installation of one.

As many other fabrics than crepes are splendidly finished on such frames, it is well for every interested manufacturer to carefully investigate their merits.

James Chittick.

Paste for Cotton Piece Goods.

Editor Textile World Record:

I notice in your April issue that "Spring" (971) wanted a paste for piece goods that would stand mangling. The following recipe is for a paste that will stand the strain of mangling for five or six hours:

2 gal. wash flour.
1 lb. farina.

Bring almost to a boil while stirring the mixture. Do not let it boil or it will become too thick. Paste the cloth together before putting it on a hot plate, then smooth it out until quite dry. This paste if properly made will stand more of a strain than the cloth itself will stand. It will not stand the boiling or bleaching process. Montrose.

Making Hosiery from Mercerized Yarn.

Editor Textile World Record:

What is the best method of making hosiery from mercerized yarn? I have been using dyed yarns but find them harsh and very apt to make defects in the heel and toe. Should mercerized yarn be twisted as soft as other hosiery yarns?

Cherokee (991).

In reply to your query regarding best method of manufacturing mercerized hosiery, "Cherokee" is having the same trouble that most manufacturers experience in trying to use dyed yarns. The same trouble is always experienced with dyed yarns, regardless of the quality of the yarn, whether mercerized, lisle or common carded yarns. In my opinion the trouble is caused more from the dye than from the yarn itself. It is almost impossible to secure as good results in the knitting from dyed yarns as from undyed or natural yarn. The process of dyeing will necessarily make the yarn hard and wiry, and hard to knit. Much depends on the process used for dyeing Some processes make the yarn much more harsh and hard than others. In latch needle machines considerable trouble is usually caused by the dyestuff coming off and filling the needles, thus making the latches work hard. This alone will cause considerable trouble in heels and toes. In cases where dyed yarns are used the needles should be looked over at least once a week and the latches made to work freely.

Where dyed yarns are used, the rivets in the latches are constantly working loose. The sinkers become badly worn at the point where the yarn is drawn over them by the needle. These needles and sinkers must be replaced with new ones to insure good work. Where it is possible to do so I would advise that goods be knit in the white or natural color and dyed afterwards. In this way better results are obtained from the knitting machines and the cost of manufacturing is reduced to a considerable extent, as there will be less seconds. There will also be a reduction in the number of needles used and also in the wear on machines.

The cost of dyeing knit goods is also considerably less than the cost of dyeing yarn. In small mills not equipped for dyeing it is sometimes necessary to use dyed yarns. In such cases considerable care should be taken in purchasing the yarns, as dyed yarns not properly treated must necessarily cause a great amount of trouble to the manufacturer. In such cases it is usually much more satisfactory to buy undyed skein yarn and have it dyed. In buying dyed yarns through the commission agents, there is no way of telling where the yarn is dyed. If the yarn proves defective, it is a hard matter to locate the responsibility. On the other hand, by buying yarn in the grey and having it dyed, there is the advantage of being able to choose the dyer and methods of dyeing. If the dye proves defective the fault is more easily corrected. As before stated, however, all dyed yarns will cause more or less trouble in knitting and especially in heels and toes. Better results are usually obtained by rewinding and running the yarn over a softening preparation, made from soap, warm water and pure olive oil. If impossible to rewind the yarn the same results may be obtained by attaching a small tin cup on top of yarn stand and placing a woolen rag well saturated with the softening preparation and over which the yarn runs. The woolen cloth can be kept well saturated by keeping the cup filled with the preparation. Great care must be taken in preparing the softener, and only pure olive oil should be used, as other grades may spot the goods. This preparation will have a tendency to liven up the yarn and also lubricate the needles so that the latches will work more easily.

In regard to amount of twist in mercerized yarns, a slack twist will run better and give less trouble in knitting than a hard twist, but will not take as nice a finish. As the finish is usually what the manufacturer is looking for in mercerized goods, they usually prefer a hard twist. The more twist there is in the yarn, the greater the luster by the process of mercerizing. Dan Bucklin.

KNITTING DEPARTMENT.

For Knitting Mill Machinery, Equipment and Supplies, see pages 235 to 253. Also Buyers' Index.

THE KNIT GOODS SITUATION.

The time is fast approaching when it will be necessary for the jobbers to purchase fall underwear more freely than they have been doing thus far, if they are to take care of their trade the coming fall. It is quite true they have had little encouragement to operate freely up to this time, as retailers have not placed 50 per cent. of a normal season's business. It is quite generally agreed, however, that there is not 50 per cent. falling off in the purchasing capacity of the country, and as manufacturers are not piling up any stocks of merchandise to take care of the deficit, jobbers must operate soon or there will be a shortage in the very near future.

Initial orders for fall were certainly very much smaller than for any recent years, and it was said as late as June 1st that several fairly good sized buyers had only bought about 10 per cent. or less of their purchase as compared with last year. A few buyers were in the market last month, but practically nothing was done by them in the way of placing orders.

It is expected now that a large number of Western buyers will be in New York about July 10 to 15 to look at spring lines, and it is probable that there will be some fall business done at that time.

In regard to prices, most manufacturers and agents claim that the bottom has been scraped and that we may now look for higher quotations as soon as business takes a start.

The reduction of prices on men's ribbed goods from $3.65 and $3.75 to $3.50 has not resulted in any increased volume of business and is condemned by many, not excepting a number of jobbers. When the goods were sold at $3.75, it was an easy matter for the jobber to get $4.25 for them, as they reached the retailers for 50c. grades, but when they are reduced to $3.50, there is a tendency to get them to the consumer at 39c. per garment, and both the retailer and jobber take less profit.

Manufacturers of fleeces stuck fairly well together in getting $3.75 for their standard grades. While there has not been a large business done on them as compared with former seasons, it is quite sure if the price had been reduced to $3.50, very few additional orders would have been placed.

Prices on ladies' fall weight ribbed goods remain the same as at our last writing, and so far as we can learn, a good number of jobbers have operated quite freely on ladies' carded seven pound goods at $2.00. Ladies' combed yarn ribbed goods, weighing eight pounds, are being offered at $3.50, although some of the larger well known mills have taken their orders at $3.62 1/2 and claim it will not be necessary to make any reduction.

Prices on wool lines have not changed any, but several manufacturers have notified their trade that they have improved the percentages and that they intend to deliver better goods than were sold in the months of December and January.

As to the time of opening for spring lines for 1909, little can be said at the present writing, but it is quite probable that this business will be well under way by the middle of July. It is predicted that stocks in jobbers' and retailers' hands will have worked down considerably by that time. As the making of light weight goods for the past four months has been curtailed to offset the restricted demand, the way seems fairly clear for a good season's business.

Some manufacturers have been showing low priced balbriggans and we understand that the Brown Knitting Co. are offering a garment weighing 4 to 4 1/4 pounds with two button drawer at $1.85. This same concern is showing a 5 pound garment with three button drawer at $1.95; both of the above have suspender tapes, and an outside band drawer may be had with the 5 pound garment at $2.00.

The Chalmers Knitting Company have been out with their line of "Porosknit" goods for spring and have taken a step to maintain prices on this line. They ask the jobbers $3.50 for shirts and drawers and $6.50 for combination suits, and on June 1, 1909, will give a rebate of 25c. per dozen to the jobbers who have maintained the prices of $4.00 net and $8.00 net respectively. This class of merchandise has become very popular during the past two years and this manufacturer makes a line of boy's goods for which there has been considerable demand. The shirts and drawers cost $1.90 with a rebate of 10c. per dozen and get to the retailer at $2.25. The combination suit costs $3.75 with a rebate of 25c. per dozen, if sold at $4.25. This company asked for a preliminary injunction against the Columbia Mesh Knitting Co. to restrain them from using the words "Poros Underwear," but this motion was denied by Judge Hough of the Circuit Court of the United States, Southern District of New York. In denying the motion the judge stated, "It is true that the word 'Porosknit' and 'Poros Underwear' are both applied to undergarments, but such garments are a staple article and may be manufactured by anyone; so far as the evidence in this case is concerned, anyone is at liberty to manufacture such garments in this manner."

The demand for nainsook shirts and drawers has increased materially this season, principally for sleeveless shirts and knee length loose fitting drawers. A number of new manufacturers have gone into making of this class of goods and prices on the ordinary pin checked nainsook has gone as low as $2.75 on a line made by North Bros. & Straus. For 1909 these people are showing a line of nainsook with sateen facing around the waist band of the drawer and down the front of the undershirt, at $3.25.

A call is also noticed for this class of goods in cream or ecru color and it might be well for some manufacturers to show these samples for another season.

The Lewis Knitting Co. of Janesville, Wis., are putting on the market a combination suit designed to give the wearer the advantage of a loose fitting nainsook garment without its disadvantages. In order to do this, they have made the entire front half of the garment of nainsook and the back half of knitted fabric to take up the strain.

We have had an opportunity of seeing a few samples of ladies' straight ribbed vests for spring, and the lines at 75c. to $1.00 show a reduction in price from last season of 5c. to 7 1/2c. per dozen. We have also looked at the line of fancy trimmed straight goods at $1.50 that were quoted last season at $1.65 to $1.70, and the $1.80 line quoted last season at $1.95.

The Lewis Jones Knitting Co. are showing a line of shaped goods in high neck, long sleeves at $1.80, and high neck, short sleeves at $1.75, that were sold last season at $1.90.

HOSIERY.

While there has been nothing that could be called a boom in the hosiery end of the business, nevertheless, there has been a decided change for the better during the past three weeks. This improvement has been principally in the demand for goods for immediate delivery, with a slightly increased call for ladies' fleeced goods for September and October delivery at around the dollar mark. Of course, manufacturers have had no great difficulty in taking care of all of these orders that have been offered them and they have had the satisfaction of taking them without any quibbling on the part of the buyers in regard to prices.

As far as we can ascertain there are no stocks of hosiery being accumulated by manufacturers. Their prices today are figured with a close margin on nearly all lines. This in connection with the fact that yarn and other materials are pointing upward should be some encouragement for buyers to place orders freely.

The guaranteed hosiery proposition has been sweeping over the country of late and to meet the craze a number of manufacturers are showing guaranteed lines at all kinds of prices. The Paramount Knitting Co. are showing two numbers of half hose put up three pairs in a box, one to cost $1.25 per dozen to job at $1.50, and to be retailed at 50c. a box; another to cost $1.85 and job at $2.25, and to retail at 75c. a box.

Shreve & Adams are also putting out guaranteed half hose called the "Endurance." Their price is $1.50 per dozen to job at $1.75 per dozen, and to be retailed at $1.25 per box put up six pairs in a box. A number of other makers are putting out guaranteed lines in ladies' and children's goods, but the bulk of the business has been taken on the men's half hose so far.

In the low end of half hose market, there has been some reductions in prices made recently. It is now possible to buy a men's black or tan half hose, 176 needle, weighing 1 pound, 4 ounces, double soles, as low as 75c.; and 2 thread, 176 needle, weighing 1 pound, 10 ounces, as low as 87 1/2c.

A KNITTING MACHINE NEEDLE.

Figs. 1 and 2 are respectively side and end views of a knitting needle, recently patented and described as follows:

The brass sleeve or spacing device at-

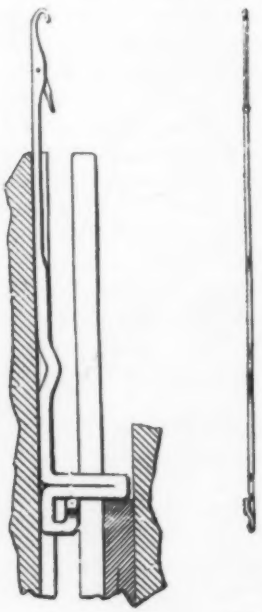


FIG. 1.

FIG. 2.

tached to the butt of the needle is dispensed with; in place of it a integral off-set is formed below the needle butt, which is extended downward and laterally and then upwardly and the upward terminal is bent near the extremity, providing a slight off-set, whereby the desired function is attained.

The invention consists of a needle comprising a body portion having its butt deflected downwardly, laterally and upwardly, the terminal of said upward extension being provided with an off-set whereby a needle of superior utility can be efficiently produced and will not be liable to get out of order.

A TRANSFERRING DEVICE.

In describing a transferring device for knitting machines, recently patented, the inventor states that at certain points in certain knitting operations it becomes necessary that loops held upon the needles be transferred to other needles. Devices for accomplishing this are called "transferring devices," and a number of such devices are well known. A loop-opener is attached to or formed upon the needle which holds the loop to be transferred so arranged that when the needle carrying the loop is thrust forward to the proper extent, the loop is expanded laterally and forwardly and lies in such position in relation to the needle, that if a transfer point, or preferably another needle to which the loop is to be directly transferred is projected alongside the first mentioned needle in proper relation to it, it will receive the loop and hold it while the first mentioned needle is withdrawn, the loop-opener being so constructed as to permit the proper relative motion of the two needles.

Such loop-openers may be used in machines adapted to knit both rib and plain tubular fabric as a continuous operation. In these machines the top being of ribbed knitting requires the use of a dial plate carrying horizontal needles, while the body of the stocking, being plain knitting, is knit wholly on the vertical needles. It is necessary at the point of transition from one variety of knitting to the other to transfer all of the loops held upon the dial needles to the corresponding vertical cylinder needles. To accomplish this all of the dial needles may be provided with loop-openers. At the proper point in the operation all the dial needles are projected so as to bring these loop-openers into play to expand their loops. There-

upon, the cylinder needles which are to receive these loops are advanced until they enter the loops. The dial needles are then withdrawn leaving the loops upon the cylinder needles alone.

Fig. 1, is a perspective view, Fig. 2 a plan of the loop-opener as applied to a dial needle.

A difficulty has been experienced in connection with the employment of these loop-openers by reason of the space which they occupy alongside of the needle to which they are attached. In order to make room for them when the needles are retracted in prior machines employing loop-openers, the walls of the grooves which receive the needles, have been cut away. The difficulty with this

FIG. 2.

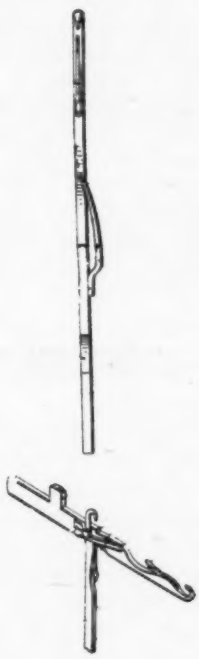


FIG. 1.

expedient is that when the needles are projected they lose the lateral support from the walls of the needle groove which is desirable in all forms of knitting operations, and which is particularly desirable in connection with transferring operations, where the utmost precision in the alignment of the needles is required.

In order to prevent the cutting away of the walls of the needle grooves, it has been proposed to make the loop-openers so yielding and to construct them in such fashion that when the needles are retracted the loop-openers are sprung into the needle grooves. But this is objectionable because of the flexibility which must be given to the loop-openers and because of the additional friction put upon the needle. With the new device the needles used have a greater depth than usual, and the loop-opener is so constructed that it is coincident with only the upper and projecting portion of the shank of the needle. By employing with such needles grooves of the usual depth, the loop-opener will entirely overhang the needle wall of the groove so that the needles are supported and held in alignment during the entire length of the grooves the walls of which reach to the knitting edge of the needle cylinder or dial plate; and yet when retracted the loop-openers are not received within the needle grooves, but pass over or overhang one of the walls. In connection with the construction of a loop-opener which thus overhangs the wall of the needle groove, a number of forms of needles provided with said loop-openers have been devised. In a number of them a feature is the integral construction of the needle and its loop-opener by the turning back upon itself of the wire or strip of which the needle is formed or a portion of it.

A KNIT BOUCLE CLOTH.

A patent has recently been issued for a cloth knit with back and face yarns, the latter being united to the former at intervals by a tying-in yarn. The face yarn is curled prior to the knitting operation so as to produce by the knitting operation itself a fabric having a mass of closely and uniformly disposed rings or curls over its entire face.

Fig. 1 shows a portion of the knitting cylinder used in making the fabric; Fig. 2 is a side view of the cylinder, showing the way the face yarn is introduced; Fig. 3 shows the face yarn as it comes from the curling machine; Fig. 4, the face of the finished fabric; Fig. 5, a section of the cloth.

The fabric comprises a face yarn, 1, of mohair or worsted, a back yarn, 2, of worsted or cotton, and a tying-in yarn, 3, of cotton. It can be knit on the ordinary type of knitting machine, that illustrated being a circular machine.

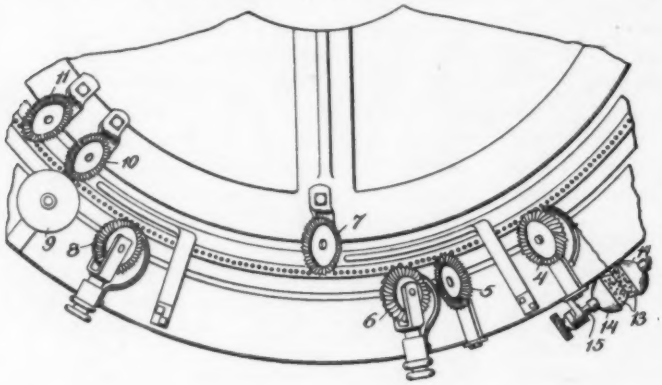


FIG. 1.

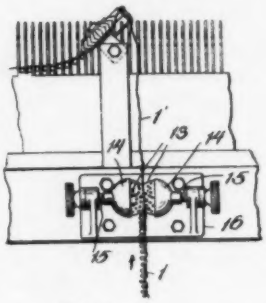


FIG. 2.

One feed is shown comprising a backing wheel, 4, which may be blocked as desired, preferably two and two, so as to stagger alternate pairs of needles; a clearing wheel, 5; a plain wheel, 6, for the tying-in yarn; a landing wheel, 7; a plain wheel, 8, for the back yarn; a plain presser wheel, 9; a landing wheel, 10; and a throw-off wheel, 11.

In addition to the parts above described the cylinder is provided with the usual horns and other elements necessary to carry out the knitting operation.

The yarn which is to constitute the face is first run through a curling machine to produce a thread having a succession of substantially uniform rings, curls or loops as indicated in Fig. 3, the rings or curls being regular in form and closely disposed. The degree of the curl may vary, the essential feature being that the face yarn shall be curled in a certain manner as to produce the desired effect for the face of the fabric; that is, the finished fabric shall present on its face a close, compact mass of rings or curls.

It is impossible for the curled yarn in its normal condition to pass through the backing wheel; in order that the said yarn may be properly placed upon the needles it is necessary that it be straightened, and for such purpose any suitable form of tension device is employed.

The tension device comprises two sponges, 13, supported in cups, 14, these cups being carried upon threaded studs, 15, adjustable in brackets on a base, 16, the latter being secured to the machine frame in proximity to the backing wheel. The sponges are saturated more or less with some suitable oil such as olive oil, and are so adjusted relatively to each other that as the curled yarn is drawn between them the drag or tension placed thereon will be sufficient to straighten the yarn as indicated by 1' in Fig. 2.

The yarn is thus made practically straight between the tension device and the backing wheel, 4, but as soon as it leaves the latter the normal curled condition is restored. The presence of the rings or curls in the face yarn after being placed on the needles does not interfere with the subsequent stages of the

FIG. 3.

FIG. 4.

FIG. 5.

knitting operation, the yarn being acted upon by the several wheels of the feed called into play after being placed upon the needles, and bound to the back yarn, 2, by the tying-in yarn, 3, in the usual manner for a straight yarn.

Standard Sizes of Cotton Underwear.

Editor Textile World Record:

We would be very glad to have you furnish us complete and accurate specifications of the three regular sizes (4s, 5s and 6s) long sleeve vests, also open and closed pants of ladies' cotton knit underwear, a seven-pound garment, the kind that retails for 25 cents. Wilcox (994).

Replying to the inquiry regarding complete and accurate specifications for the three regular sizes of ladies' ribbed vests and pants in a seven (7) pound garment to retail at 25c., this class of merchandise should be made on 12, 13 and 14 inch heads with approximately 300, 320 and 340 needles, and the measurements should be as below:

Vests.

Size mark	4	5	6
Full length	31	32	33
Size of neck	16	17	18
Length of busts	14	14	15
Waist	4	4	4
Skirt	13	14	14
Depths of vents	9	9	9
Size of armholes	14	16	18
Length of sleeves	19	20	21
Length of cuffs	5	5	5

Open Pants.

Size mark	4	5	6
Full length	38	40	42
Length of cuffs	12	12	12
From top to opening	9	10	11
From top to crotch	16	17	18
Width across tops	30	32	34
Width across hips	38	41	44
Width across knees	14	15	16
Width across ankles	8	8	8
Depths of plackets	7	7	7

Closed Pants.

The same measurements, leaving out the "top to opening."

REVISED SCALE OF SIZES ADOPTED OCTOBER 12, 1907.

Ribs, Infants'.

Size mark	0	1	1½	2	2½	3
Neck	9	10	10	10	10	11
Chest	15	16	16	17	17	17
Vest length	13	14	15	16	17	18
Sleeve length	8	9	9	10	10	11
Arm hole	7	7	8	8	8	9
Upper arm	5	5	6	6	6	6
Lower arm	4	4	5	5	5	5

Flat, Infants'.

Size mark	0	1	1½	2	2½	3
Neck	10	11	11	11	12	12
Chest	18	20	20	22	22	22
Vest length	12	12	13	14	14	15
Sleeve length	8	9	9	10	10	11
Arm hole	7	7	8	8	8	8
Upper arm	6	6	7	7	7	7
Lower arm	5	5	6	6	6	6

Children's.

Size mark	2	4	6	8	10	12	14	16
Neck	11	12	13	13	14	14	15	15
Chest	18	18	19	20	21	22	24	26
Vest length	16	18	20	22	24	26	28	30
Sleeve length	12		14		17		19	
Arm hole	10		11		13		15	
Upper arm	6	7	7	7	8	8	9	9
Lower arm	6	6	6	6	7	7	7	7
Waist	22	24	24	24	26	26	28	28
Hip	18	19	20	22	23	25	27	29
Thigh	10	11	11	12	13	14	15	16
Rise band to crotch front	7½	8	9	9½	10	10½	11½	12½
Rise band to crotch back	9½	10	11	11½	13	13½	14½	15½
Inseam	13	15	17	20	23	25	27	29
Trunk	37	40	44	47	51	54	58	62

Children's.

Size mark	2	4	6	8	10	12	14	16
Neck	11	12	13	13	14	14	15	15
Chest	22	24	24	26	26	28	30	32
Vest length	15	17	19	21	23	25	27	29
Sleeve length	11		13		16		18	
Arm hole	10		11		13		15	
Upper arm	7	8	8	9	9	10	11	11
Lower arm	6	7	7	8	8	8	9	9
Waist	22	24	24	24	24	26	26	28
Hip	23	24	25	27	29	32	34	36
Thigh	12	13	14	15	16	17	19	21
Rise band to crotch front	7½	8	9	9½	10	10½	11½	12½
Rise band to crotch back	9½	10	11	11½	13	13½	14½	15½
Inseam	12	14	16	19	22	24	26	28
Trunk	35	38	42	45	49	52	56	60

Boys'.

Size mark	8	10	12	14	16
Neck	13	13	14	15	15
Chest	21	21	22	24	26
Vest length	22	24	26	28	30
Sleeve length	18	19	20	21	22
Arm hole	10	11	12	13	14
Upper arm	7	8	8	9	9
Lower arm	6	7	7	7	8
Waist	24	26	27	28	29
Hip	22	23	25	26	28
Thigh	12	13	14	15	15
Front rise	9	10	11	11	12
Back rise	12	13	14	15	16
Inseam	20	23	25	28	30
Trunk	47	51	54	58	61

Boys'.

Size mark	8	10	12	14	16
Neck	13	14	14	15	15
Chest	26	26	28	30	32
Vest length	21	23	25	27	29
Sleeve length	17	18	19	20	21
Arm hole	10	11	12	13	14

Upper arm	9	10	10	11	11	
Lower arm	8	8	8	9	9	
Waist	24	26	27	28	29	
Hip	27	29	31	33	35	
Thigh	15	16	17	18	19	
Front rise	9	10	11	11	12	
Back rise	12	13	14	15	16	
Inseam	19	22	24	27	29	
Trunk	47	51	54	58	61	

Men's.

Size mark	32	34	36	38	40	42	44	46
Neck		16	16	17	17	18	19	20
Chest		28	29	30	32	34	35	37
Shirt length		32	33	34	34	34	35	35
Sleeve length		23	23	23	23	23	23	23
Armhole		15	16	16	17	18	19	20
Upper arm		10	10	11	11	12	13	14
Lower arm		8	9	10	10	11	11	11
Waist	30	32	34	36	38	40	42	44
Hip	29	30	31	32	34	35	37	38
Thigh	16	17	18	19	19	20	21	21
Front rise	13	13	13	14	14	14	15	15
Back rise	17	17	18	19	19	20	20	21
Inseam	31	31	32	32	32	32	32	32
Trunk	62	62	64	66	67	68	69	70

Men's.

Size mark	32	34	36	38	40	42	44	46
Neck		16	16	17	17	18	19	20
Chest		34	36	38	40	42	44	46
Shirt length		30	31	32	32	32	33	33
Sleeve length		22	22	22	22	22	22	22
Armhole		16	16	16	17	18	19	20
Upper arm		12	13	14	14	15	16	17
Lower arm		10	11	12	12	13	13	14
Waist	30	32	34	36	38	40	42	44
Hip	36	37	38	40	42	44	46	48
Thigh	20	21	22	23	24	25	26	26
Front rise	13	13	13	14	14	14	15	15
Back rise	17	17	18	19	19	20	20	21
Inseam	30	30	31	31	31	31	31	31
Trunk		62	64	66	67	68	69	70

Rib, Women's.

Size mark	34	36	38	40	42	44
Neck	16		17		18	
Chest	26	28	30	32	34	36
Vest length	31		32		33	
Sleeve length	21		21		21	
Arm hole	16		18		20	
Upper arm	10		11		13	
Lower arm	8		10		12	
Waist	26	28	30	32	34	36
Hip	32	34	36	38	40	42
Thigh	18	19	20	21	22	23
Front rise	14		15		16	
Back rise	18		20		22	
Inseam	29	29	29	30	30	30
Trunk	62	64	66	68	70	72

Flat, Women's.

Size mark	34	36	38	40	42	44
Neck	16		17		18	
Chest	34	36	38	40	42	44
Vest length	29		30		31	
Sleeve length	19		19		19	
Arm hole	16		18		20	
Upper arm	12		14		16	
Lower arm	10		12		14	
Waist	26	28	30	32	34	36
Hip	40	42	44	47	50	53
Thigh	23	24	25	26	27	28
Front rise	14		15		16	
Back rise	18		20		22	
Inseam	28	28	28	29	29	29
Trunk	62	64	66	68	70	72

Sizes on flat goods scale are based on 1-1 rib goods of winter weight and a stretch of 25 per cent. in width is allowed. This allowance may be increased up to 30 per cent. as the goods run lighter in weight, or decreased with more rigid fabrics.

"All waist measurements are for pants and drawers with non-elastic bands, and not vests and shirts."

"Trunk measurements are for union suits only."

"Sleeve length is based on a garment not cut at the shoulder. Where this is done the sleeve must be lengthened accordingly."

Where the front and back rise from the inseam to top of band are made the same, they must both be the same length as the back rise as here given, and not one-half the sums of the front and back.

The measurements that I have given are those used by a manufacturer of a line of goods that we have had no complaint on. This question of sizes is just now receiving the attention of the National Wholesale Dry Goods Association. Last fall a committee from that association framed a new scale of sizes which was printed in your issue of February, 1902.

Since that time, however, these measurements were revised by this committee and on Oct. 12, 1907, the scale given above was adopted. I understand that several manufacturers are conforming to these measurements. They are larger than the ordinarily accepted scales and manufacturers are getting extra prices where they use these sizes. One good feature of it is doing away with sizes 4, 5 and 6 in women's sizes, which of themselves mean nothing, and substituting sizes 34, 36 and 38. When a lady comes to the counter for underwear, it is an easier matter to arrive at the size required by speaking of bust measurement, rather than sizes 4, 5, 6.

FILLMORE.

A KNITTING MACHINE FOR PILE EFFECTS.

The object of a knitting machine recently patented in this country is to produce a fabric with tufts or loops at intervals as desired. Fig. 1 is a plan of the needle cylinder, showing the needles, the loop-forming device and the cam ring. The arrow shows the direction in which the cam ring moves in relation to the needle-operating mechanism. Fig. 2 is a sectional view of the cam and needle cylinders. During the operation of the machine to produce knitted fabric the cam wheel is slowly rotated, causing the high and low portions of the wheel to engage the lower end of the lever in alternate succession, and thus rocking the lever causing the bar to be moved back and forth, thus raising and lowering the cam at certain intervals, as previously explained. When the cam occupies the raised position, the bar will be moved inwardly causing the lever to move the bar outwardly to advance the cam-ring

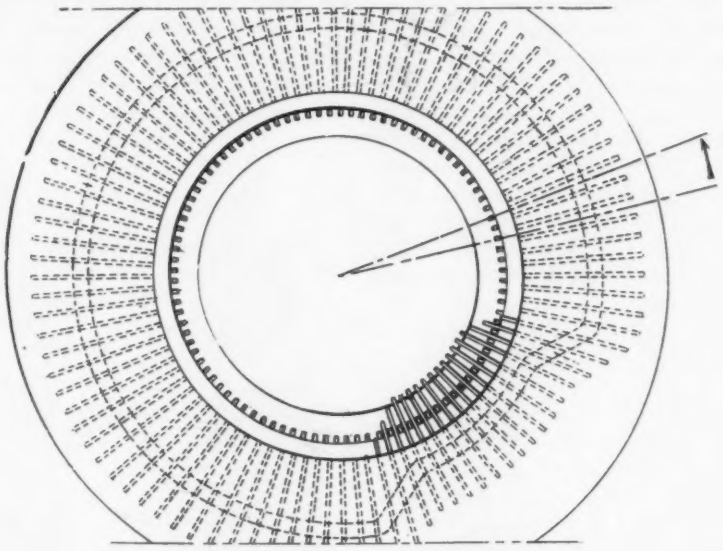


FIG 1.

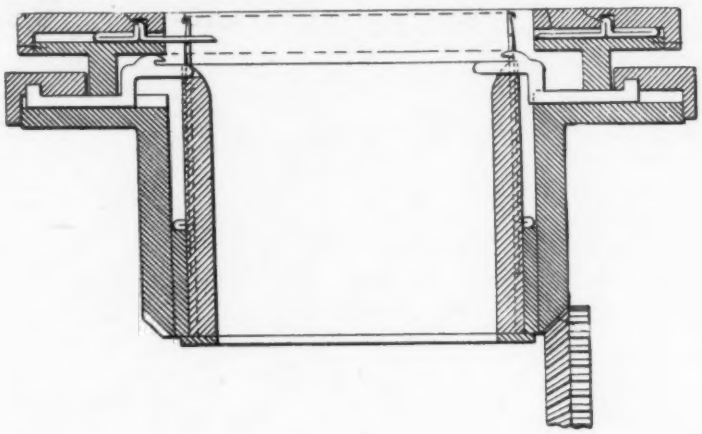


FIG. 2.

and produce the tufts or pile-loops upon the fabric, So long as the cam remains down, or while the lower portion of the cam-wheel is engaged with the lever, the machine will produce the tufts or pile-loops upon the fabric. When the high portion engages and rocks the lever the cam will be raised into the path traversed by the bar, which will engage the cam and be moved inwardly to retard the movement of the cam-ring, and thus cause the machine to cease to produce the tufted fabric and to produce plain knitted fabric, so long as the lever rests against the high portion of the cam-wheel. By loosening the clamps and adjusting the plate the length of the tufted portions and the length of the plain portions of the fabric being produced may be varied.

It has been found desirable to raise the thread-feeding eye to bring the threads close together during the production of the plain knitted fabric, particularly so when the machine is used in connection with a machine for knitting stockings, for the reason that one of the threads, if separated, is likely to catch upon the loop-holders when the direction of motion of the cam-cylinder and thread-feeds are reversed during the vibration of the cam-cylinder in knitting the heel and toe parts of a stocking. To accomplish this, the eye is formed in one end of a lever, which is pivoted to the latch-guard and held normally in position by the action of a spring secured to the latch-guard and engaging the lever. The other end of the lever extends outwardly in line with an arm to the end that when the bar is moved inwardly to cause the machine to produce plain knitted fabric the arm will take against the lever and move it against the action of the spring to bring the thread feeding eye close to the other eye, and when the bar is moved outwardly in causing the machine to produce tufted fabric the spring will be permitted to move the lever to lower the eye.

The exports of wool from Australia and New Zealand from July 1, 1906, to March 31, 1907, were 1,550,000 and 366,000 bales respectively, an increase of 215,000 bales, as compared with the corresponding period of last season.

THE NEW "SUPREME" KNITTING BOBBIN.

The accompanying illustrations show the new "Supreme" knitting bobbin and the ordinary bottle bobbin. This new bobbin is an improved form of supply package for delivering yarn to knitting machines and is the product of a winding machine invented by Simon W. Wardwell, of Providence, R. I.

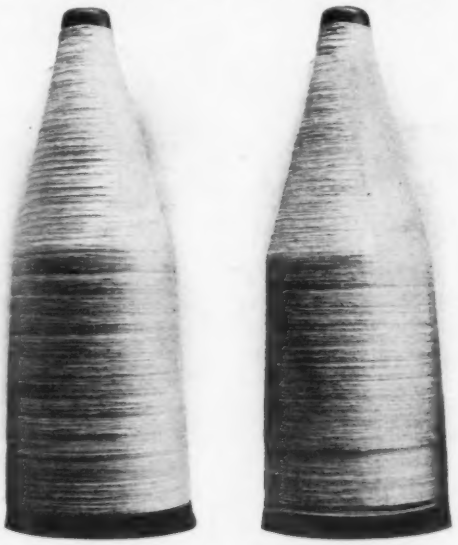


FIG. 1. TWO ORDINARY BOTTLE BOBBINS EACH CONTAINING TWO POUNDS OF YARN.

The remarkable features of this package are its large thread carrying capacity and perfect delivery of the yarn without breaks or pulloffs. The "Supreme" bobbin is smaller than the regular bottle bobbin, but contains from two to three times as much yarn as the latter; it therefore runs from two to three times as long in the knitting machine, saving from one-half to two-thirds the expense of doffing. It is claimed that the yarn is delivered with uniform tension, without a break, from start to finish of unwinding, which results in a saving of practically all the waste of the present method, due to broken ends.

In place of the usual heavy wooden bobbin, the new package is wound on a light, inexpensive, paper tube with a very small wooden butt, and there is consequently an appreciable saving in weight and cost of bob-

bins. It is stated that the tube is practically indestructible, conveniently handled, proof against injury or deterioration, and that on account of the increased carrying capacity, only half or a third the number of bobbins are required.

Several large knit-goods manufacturers have tested the new bobbin on their knitting machines and in every case it has been approved. One knitter has the following to say concerning its advantages:

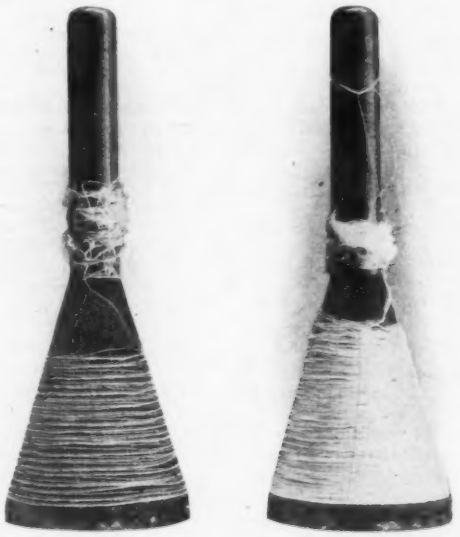


FIG. 2. BOBBINS FROM WHICH THE YARN SHOWN AT FIG. 1 HAS BEEN WOUND.

I regard its great economic importance to the knitting industry as beyond question. The bobbin from which the test was made, while in bulk considerably smaller than our regular bottle bobbin, contained three times the quantity of yarn held by the latter. While the regular bobbins run off in about two hours, the "Supreme" bobbin lasted six hours and twenty minutes and ran from start to finish without a break or stop.

The effect of the free delivery of the yarn upon the quality of the fabric knitted from these bobbins is very noticeable. Speaking of this, a manufacturer says:

The "Supreme" bobbin of worsted ran eleven hours and the delivery throughout was perfect. This merino worsted in No. 40s is difficult stuff to handle and gives us more or less trouble and makes considerable waste. In the test just made there was absolutely no waste and the fabric produced was of a superior quality.

The illustrations show the method of winding the yarn in a "cross-wind" in contradistinction to the usual parallel wind of the bottle bobbin. While the yarn is pressed into a dense mass of minimum bulk, the winding is accomplished with a very delicate tension, so that the yarn is not pulled down or weakened. It is also claimed that all objectionable slubs, knots, bunches and weak spots can be eliminated in the winding process so that the yarn which enters into the fabric is of a uniform and superior quality.

The "Supreme" knitting bobbin is wound

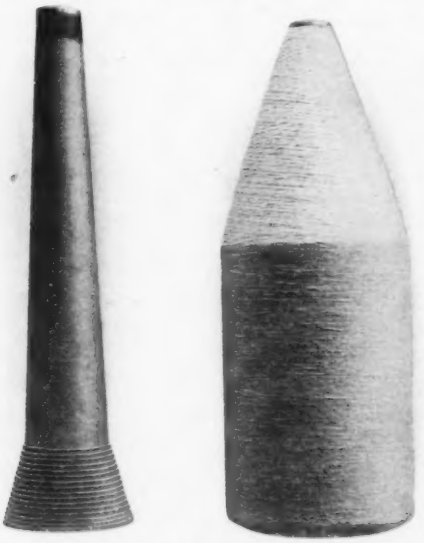


FIG. 3. A PAPER TUBE ON WHICH THE YARN FROM THE TWO BOBBINS AT FIG. 1 WAS WOUND BY THE "SUPREME" SYSTEM, MAKING ONE BOBBIN SHOWN AT THE RIGHT.

at high speed, meaning maximum production per operator and per spindle, on an automatic self-oiling machine, which operates with very little attention and care and requires practically no adjustment. The machine is exceedingly simple, proof against wear or breakage and runs with little power. It is built in gangs of six spindles and occupies a minimum floor space. The supreme Knitting Bobbin Co. are the manufacturers and machines can be seen in operation at their factory in Providence.

The centre of the cotton textile trade in Italy is at Busto and Gallarate, a few miles north of Milan. Here there are 150,000 looms exclusive of hand looms, and about 5,000,000 spindles.

KNITTING MILL NEWS.

New Mills.

*Connecticut, Norwich. Nothing definite has been decided in connection with the proposed knitting mill. Messrs. Durand and McClure of Philadelphia, who are promoting the enterprise, propose to start with a capital of $50,000 if $100,000, which was the original figure, cannot be raised. The Board of Trade has appointed a committee to investigate the proposition.

*Georgia, Brunswick. The Brunswick Knitting & Mfg. Co., reported incorporated with capital stock of $20,000, has secured a building and purchased machinery. J. E. Moody will be manager.

*Illinois, Milford. Manufacuring was started in the new plant of the Schwartz Bros.' Knitting Mills, equipment for which was moved here from Chicago. High grade sweaters are made from 216s and 3/21s worsted yarns. Adolph Schwartz is in charge.

*Massachusetts, Great Barrington. The Reliable Mfg. Co. is getting well under way and adding new hands as fast as possible. Owing to the inexperience of the operatives available, production is not as great as could be desired at this time. The new finishing department is in operation.

*North Carolina, Flat Rock. The Skyland Hosiery Co. has completed its knitting plant, which consists of a large modern building equipped with 200 latch needle knitting machines, 40 loopers and 50 ribbers, and other machinery for the production of seamless cotton and lisle hosiery. The capital stock is $150,000. J. F. Wilcox is president, F. S. Wilcox, vice-president, H. E. Stillwell, treasurer, and C. P. Rogers, superintendent.

*Ohio, Cleveland. The Keetch Knitting Co., recently reported by us as having been incorporated with a capital of $50,000, it is said, will take over, greatly enlarge, and operate the plant owned and operated by the Raven Knitting Co., 8410-12 Lake Avenue, which contained nine knitters and four sewing machines, which were run on fancy knit goods, sweaters, cardigans, etc. The officers of the company are William I. Keetch, president; C. A. Raven, formerly president of the Raven Co., vice-president, and H. C. Clark, secretary and treasurer.

*Pennsylvania, Ariel. The Ariel Knitting Mill Co. is ready to start manufacturing 11 knitting machines and 13 sewing machines have been put in place and will be run on men's ribbed underwear, using 7s to 18s carded and combed yarns. This company has been incorporated with capital stock of $15,000 and the following officers have been elected: L. P. Ross, president; C. E. Chittenden, Scranton, Pa., treasurer; J. W. Sandercock, general manager and buyer, and Claude Hibbard, superintendent. L. P. Ross will sell the product.

*Pennsylvania, Lititz. By fall, the promoters of the Fulton Hosiery Co. expect to carry out plans for their proposed plant. John K. Dyer is at the head of this project. Complete details have been given previously.

Pennsylvania, Philadelphia. J. A. O'Connell, who will sever his connections with the firm of O'Connell & Torpey, proprietors of the Marion Hosiery Mills, Mascher St. and Lehigh Ave., July 1, has leased the first floor of the Empire Mills, Huntingdon St. and Kensington Ave., which he is getting ready to equip with machinery for the manufacture of hosiery. It is said that the plant will be in operation some time during the month of July.

Pennsylvania, Philadelphia. George Remsen's knitting plant on Front St., below Clearfield, is not yet in full operation. Three knitters are running on hosiery, with many others yet to be delivered. It is expected, however, that the machines will be in the mill and in operation within a few months, at which time the plant will be started full on orders.

Pennsylvania, Reading. Charles T. Davies, formerly of the firm of Leippe & Davies, has started a plant of 40 knitting machines on split-sole hose and half hose, from 24s to 60s Egyptian and 2/24 to 2/30 combed and carded Peeler yarns, giving employment to about 30 hands. The new concern is known as the Davies Hosiery Co. Mr. Davies is interested in information regarding baskets and hosiery winders.

*South Carolina, Lexington. L. W. Redd of the new Rikard Knitting Co., recently incorporated with capital stock of $10,000, has awarded contract for 25 knitting machines and a steam power plant.

West Virginia, Fairmount. The Knox Sox Co., a concern with capital stock of $5,000, has installed six knitting machines and one sewing machine in a building at this place and begun the manufacture of men's seamless hosiery, giving employment to eight hands. The plant is operated by steam power. A selling agent to handle the product has not been decided upon as yet. J. P. Thompson is president and R. Knox is treasurer, manager and buyer. The present quarters are temporary, as the company expects to expand and erect a building with space for greatly increased equipment.

Enlargements and Improvements.

Alabama, Fort Payne. The Davis Hosiery Mills of Chattanooga, Tenn., will add 50 new knitting machines, which will arrive in installments of 10 machines a month and be set up immediately on arrival. To make room for the new machinery, some of the old machines will be taken out and shipped to the plant at this place, greatly increasing the output. It is stated that other improvements are contemplated for the near future about which information cannot be given out at the present time.

*Georgia, Atlanta. The new building for the Atlanta Hosiery Mills, whose plant was destroyed by fire in March, is about completed and some of the machinery equipment is being put in place. Complete details have been given previously.

*Kentucky, Paducah. Improvements in the plant of the Wisdom Hosiery Mills, formerly the Dixie Mills, have been completed. It is stated that the plant will work overtime until 10 o'clock at night to keep up with orders on hand.

*Massachusetts, Lowell. The second addition to be built by the Lawrence Mfg. Co. is a 2-story building, 159 by 44 ft., which will be used for making packing boxes. The power plant which we reported would be installed in a part of this new building will consist of a boiler and engine to drive the box shop only. The estimated cost is $7,500. Work is not started yet on the structure of the new 5-story mule spinning mill.

New Jersey, Riverside. W. F. Taubel has given out the contract to a firm of Philadelphia builders for the erection of a new four-story and basement building which will measure 244 by 49 ft., to be constructed of brick, with a stone facing in front. The new building will be used as an addition to his present plant, in which he operates 150 latch and 50 spring needle knitters on men's, women's, misses' and infants' seamless hosiery, which he dyes and finishes and sells direct. Mr. Taubel also operates branch plants in Tamaqua, Shamokin, Mt. Carmel and Philadelphia, Pa.

*New York, Hudson. In addition to installing a new boiler, the Swansdown Knitting Co. will erect a new boiler house.

New York, Niagara Falls. The Visor Knitting Co. has been reorganized with capital stock of $40,000. The mill buildings have recently been completely remodeled and new improved knitting machinery installed. The officers are Bernard Rautenburg, president; Hector MacBean, secretary and Max Amberg, treasurer.

New York, Oswego. It is reported that the stockholders of the Oswego Knitting Co. have decided to increase the capital stock from $15,000 to $30,000, the increase to be used for enlarging the equipment of the company. At present the plant is running night and day.

*North Carolina, Burlington. Improvements to the Whitehead Hosiery Mills, to provide for which capital stock was recently increased to $5,000, have been completed, and plant is now in full operation manufacturing 240 dozen pairs of mercerized half hose daily.

*Pennsylvania, Bethlehem. The proposed hosiery and underwear plant, reported some time ago, has fallen through. E. J. Gerlach advises that the 3-story building which was being considered for a factory is now for sale.

Mills Starting Up.

Georgia, Rockmart. After a shut down of several weeks, the Rockmart Hosiery Mills have resumed operations in full.

*Massachusetts, Northampton. Suitable arrangements have been made for adjusting the difficulty between the McCallum Hosiery Co., Inc., and the striking operatives, and the latter have returned to work. The mill is being operated on full time.

New York, Johnstown. The Johnstown Knitting Mill Co., Inc., has resumed operations in full, nearly all the old help returning to their machines.

Mills Shutting Down.

Pennsylvania, Philadelphia. The Defiance Knitting Mills in the Fretz Building, 10th and Diamond Sts., have shut down their plant and will not start it up again until they commence the heavyweight season. They are manufacturers of women's and children's ribbed underwear of cotton wool, worsted and mercerized yarns, operating 18 knitters and 28 sewing machines.

Facts and Gossip.

Canada, Ontario, Brantford. The machinery equipment of the Brantford Hosiery Co., Ltd., has been purchased by the Chipman Holton Knitting Co. of Hamilton. The machinery will be moved to the latter company's plant, the Brantford Co. discontinuing business here.

Georgia, Alma. The Commercial Club claims to be at the point of consummating a deal for a knitting mill to be located here which will give employment to 100 people.

*Michigan, Detroit. S. J. Southwood, who has been reported to be operating a small knitting plant on wool and worsted sweaters, advises that he is not connected with a knitting plant in any way. Mr. Southwood merely made inquiries regarding equipment for a knitting mill in the interest of another party who expects to start such a plant.

*Michigan, Grand Rapids. The Star Knitting Works advises that reports to the effect that they will start a branch plant are incorrect. We previously reported that they were considering Ralston, Neb., for a branch of the main plant.

New York, Amsterdam. The Van Brocklin & Stover Knitting Mills, which have been running on part time for several months, have resumed operations on full schedule.

New York, Phoenix Mills. It is reported that a movement is being agitated in Cooperstown, N. Y., for the formation of a company to take over the Fenimore Knitting Mills of this place.

New York, Perry. The Perry Knitting Co. is running two shifts, keeping the plant in operation day and night. Men's, women's and children's flat, ribbed and fleeced underwear and union suits are manufactured on 8 sets of wool cards, 164 knitting and 393 sewing machines.

*New York, Rome. Reports that the Columbia Knitting Mills were damaged by fire are incorrect. The fire reported was in the plant of the Fort Stanwix Knitting Co.

New York, Waterford. The mill of the Massasoit Knitting Co., together with water rights estimated at 600 horse power, located in this town, has been sold in mortgage foreclosure proceedings by Referee Jacob L. Ten Eyck to Samuel L. Munson of Albany for $24,000.

Ohio, Cleveland. M. B. Sharfeld, 618 Society for Savings Bldg., is contemplating starting the manufacture of low grade men's seamless half hose, and is now gathering information on the subject.

New Machinery and Processes.

This department is designed to present from month to month a brief mention of new machinery, devices and processes being brought out in this country and abroad, that are of interest to textile manufacturers. It is not a list of patents, but of improvements coming on the market. The idea being to present to our readers a systematic monthly record of new machinery etc., of interest to textile mill men.
We invite machine builders and others to send us such information for this department.

Mill Engraving Machine. W. T. Ellison & Co., Ltd., Manchester, England. A machine for engraving copper rolls for calico printing. It is fitted with two sets of self setting cones so arranged that a roll can in a few minutes be placed on the mangle to run perfectly true without the use of a setting board. These setting cones hold the roll in such a position that the heaviest class of work will not cause any movement of the roll. The machine embodies a number of other useful features.

Reversing Device for Cards. J. Pilling, Gee Cross, Hyde, England. A mechanism for reversing the cylinder of a card when grinding. A rim pulley is fastened to the loose pulley on the card. A cross belt runs from this rim pulley to another rim pulley on a short counter shaft temporarily set on the frame of the card. On this counter shaft is a pulley from which a belt drives the tight pulley on the card, driving the cylinder in the reverse direction.

Weft Replenisher Loom. Harling & Todd, Rosegrove Iron-Works, Burnley, England. An automatic attachment for supplying filling to the loom while in operation. The weaver places the cops in a magazine, from which they are automatically supplied to the shuttle in the loom. The device is now in operation at Lancashire on looms running 180 picks a minute and can be applied to old looms if desired.

Yarn Winding Device. James Heathcote, Rainow Mills. Bollington, Macclesfield, England. A method of winding yarn on the bobbins on clearer frames, the object being to prevent difficulties now found in unwinding the ordinary bottled shaped bobbin.

Warp Leasing Machine. Ashton Bros. & Co., Manchester, England, have invented a machine for taking the lease in warps that are to be tied on the Barber warp tying machine.

Damping Machine. S. Walsh & Sons, Bury, England. A machine for damping cloth worked on the water jet system.

Yarn Damping Machine. Knowles & Co., Globe Works, Bradford, England. A machine for damping yarn on cops and bobbins in order to set the twist.

Swab for Cloth Shears. Hutter & Schrants, Niemes, Bohemia. An improved swab for oiling shear cylinders. It consists of three separate fabrics. The upper and lower ones are made of wool felt and the middle one is a cloth made of vegetable fiber. The oil is poured on the upper felt and passes to the middle layer, from which it is transmitted uniformly to the cylinder.

Cloth Measuring Machine. A. M. Casperson & Sons, Leeds, England. A machine for measuring cloth. The fabric runs over large wheels which are adjustable for different weights of goods.

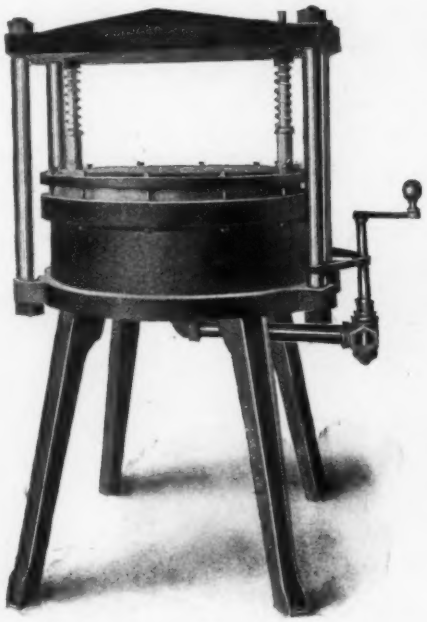
Attachment for Ring Frames. James Hope, 18, Quai de la Bourse, Rouen, France, has recently placed on the market an attachment for ring spinning frames, by which the speed of the spindles is varied to conform to the different positions of the yarn on the bobbin. The slow speed is used when winding at the point of the bobbin and until the full diameter is reached, then the speed is increased. The inventor states that the high speed is used for five-sixths of the time, slow speed for one-sixth. The attachment has been in use in French mills for some time and has lately been introduced into Lancashire. Manufacturers at Deville-les Rouen, France, who have been using the Hope motion on Platt frames, state that it gives an increase of 8 per cent. in the production.

Filling Mangle. Jackson & Bro., Bolton, England. An improved mangle especially designed for heavily weighted goods.

THE "BRIDGER" HYDRAULIC CUTTING PRESS.

This machine is specially designed for the use of underwear manufacturers for cutting trimmings, shirt and drawer bands, gussets and fronts, and in fact anything that can be cut with a die. It takes the place of cutting knives and cutting forms. The method of operation is simple. It is operated by water pressure of 35 lbs. or more. Its capacity is very large.

Messrs. A. V. Morris & Sons of Amsterdam, who are using one in their No. 4 mill,



THE "BRIDGER" HYDRAULIC CUTTING PRESS.

state that it works with perfect satisfaction and trimmings for a production of 1,500 dozen per day are taken care of by this one machine.

It has only quite recently been on the market, but a number of prominent mills in New York state have adopted it. It is made in three sizes, 18, 24 and 30-inch, by the Tolhurst Machine Works, Troy, N. Y.

HIGH SPEED RADIAL DRILL.

To mills whose equipment includes a repair department capable of making ordinary repairs necessary in every-day running, —and nearly all mills of medium or larger proportions maintain a repair department of this capacity—the machine shown in the illustration should prove of interest. It is a 2-foot back geared, high speed radial drill, recently brought out by the American Tool Works Co. of Cincinnati.

This drill has been designed especially for high speed work, substituting for the larger sizes of upright drills over which it has advantage in economy of power, convenience in handling, accuracy and rigidity. For convenience alone it seems that the radial drill should supplant the upright and the above company has shown faith in its ability to measure up to the needs for machines adaptable to a large range of work by bringing out a full line of radials having 2 ft., 2 1/2 ft., 3 ft., 4 ft., 5 ft., 6 ft. and 7 ft. arms. The 2-foot drill shown measures as follows: From drills to center of circle outside of column, 4 ft. 5 in.; greatest distance from spindle to base, 3 ft. 9 1/2 in.; traverse of spindle, 11 in.; traverse of head on arm, 16 in. It is built with either cone pulley or speed box drive. For practically all work required in textile mills the above dimensions would meet the requirements.

A special feature which has been thoroughly and carefully provided for in every bearing is adequate lubrication. The increased speeds and feeds possible through the most modern machine tools require that they have superior lubricating facilities than the older style machines. The feeding mechanism on the head provides four rates of feed a range from .007 to .02 in. per revolution of spindle. The simplicity of the method of obtaining the desired feed deserves special attention. Simply by turning the knob on the feed box until the mark on the dial indicating the feed wanted comes opposite a fixed pointer, the desired feed is obtained. The feeds operate through a friction which permits the drill to be crowded to its limit without strain to the feed works. In this connection it may be stated that all gear

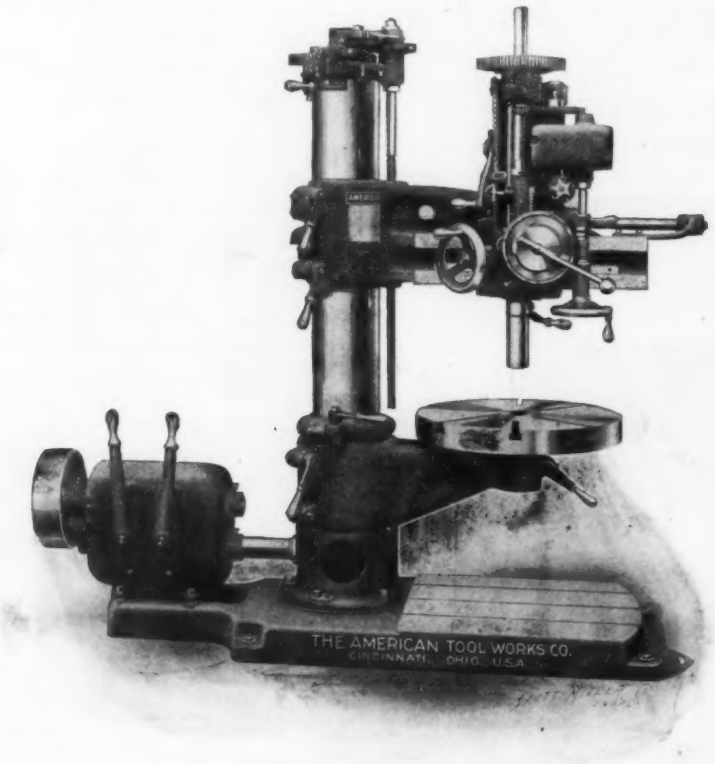
feeds are supplied if desired, instead of belted feeds, giving increased productive capacity, rapidity of change and positive action. Feeds can be automatically stopped at any position of spindle by adjusting the trip dog and pointer.

The speed box shown in the illustration is of the geared friction type providing four changes of speed, each of which is available instantly by use of the two levers shown. The builders claim there is absolutely no shock to the parts when throwing in any speed. Any type of motor may be attached either directly or indirectly.

To make the drill equally efficient with either ordinary or high speed twist drills of extreme sizes, and for boring or tapping, the spindle has sixteen changes of speed ranging from 33 to 400 revolutions per minute. Any speed within this range can be had immediately without stopping the machine. An engraved steel plate enables the operator to select the proper speed. The spindle is counterbalanced to insure smooth running and accuracy and has frictional quick advance and return.

The column is of the double tubular type, the outer column revolving on conical roller bearings. When clamped in position it is practically integral with the inner column, affording exceptional rigidity. The arm is clamped to the column by two binder levers and is raised or lowered by a double thread, coarse pitch screw which allows of its being moved rapidly. Its design leaves the lower line parallel with the base, carrying out the idea of utility by allowing work to be operated upon close to the column without an extreme reach of spindle.

The mechanism of the head and the arrangement for adjusting it to the work to be done is plainly shown in the illustration.



A HIGH SPEED RADIAL DRILL.

It can be rapidly moved along the arm by the hand wheel through the rack and spiral rack pinion and locked in position by a convenient clamping device. The back gears are located in the head, which brings the greatest speed reduction to the spindle. They may be engaged or disengaged while the machine is in motion and without shock, the high speed being run through a friction. The arrangement of the tapping motion on the head between the back gears and speed box makes unusually heavy tapping operations possible and permitting taps to be backed out at an accelerated speed.

It is not possible to note all the features of these drills which make for the high productive capacity and ability to stand up under speeds and feeds impossible a few years ago. The manufacturers will be glad to give full information, including the results of a series of drilling and tapping tests in cast iron and steel which were conducted under practical conditions.

A NEW MACHINE FOR MEASURING AND MARKING FABRICS.

The illustrations show machines recently brought out by the Parks & Woolson Machine Co. of Springfield, Vt., for winding any width or grade of cloth, measuring the yardage and printing the number of each yard in rotation on the back of the cloth, with the trade mark of the mill or any other mark as desired. All this work is done automatically. If desired, half yards, quarters and even eighths may also be printed on the goods. Fig. 1 shows Model J, which rolls up the goods full width, measuring and printing the length in yards with trade mark or other suitable matter, while Fig. 2 shows Model E, which performs the same operations and in addition doubles the cloth so that the selvages come together. Goods may be rolled, measured and printed at a speed of 35 to 100 yards per minute, depending upon the nature of the work.

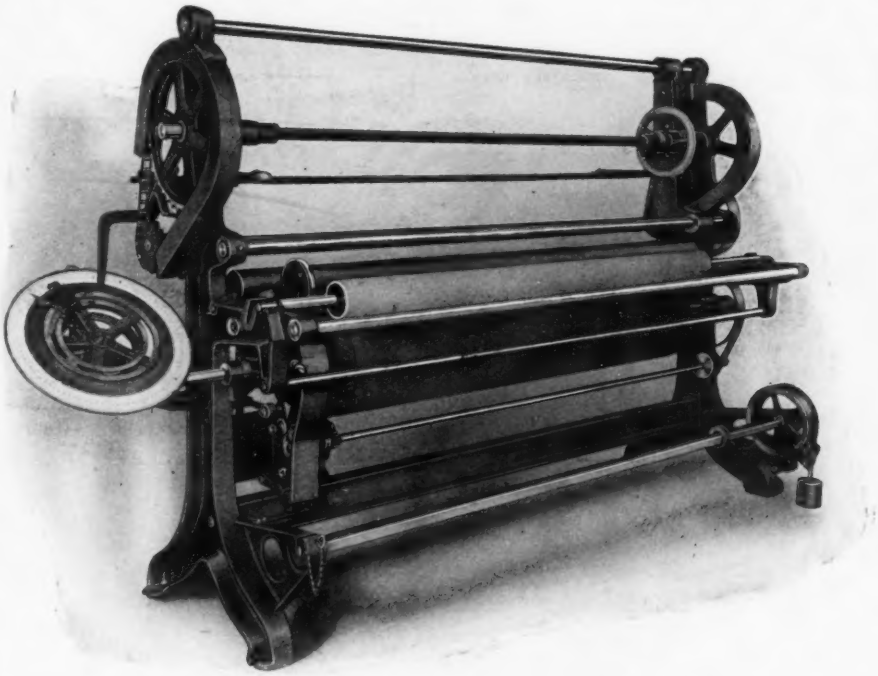


FIG. 1. PARKS AND WOOLSON MEASURING AND MARKING MACHINE, MODEL J.

To obtain a machine with these added features, the operation has not been complicated. Cloth may be brought from the finishing room to the machine either on a roll or in the folds, just the same as to the common styles of winding and doubling machines, and any ordinary hand can operate it. The cloth is usually brought in strings of several pieces sewed or fastened together, one piece running into the machine after another in order to avoid threading the machine for every piece. When it is necessary to make two or more pieces out of a cut of cloth there is a device which may be set to stop the machine automatically at the required length. If the cloth is brought to the machine in separate cuts, not fastened together, the measuring device is stopped automatically when the end goes through, preventing a larger number of yards than actual from being registered on the dial. All parts of the machine can be set instantly and the power required is not greater than ordinary.

Either of the models shown may be set in any convenient place and driven from a shaft with belt or electric power, the builders being equipped to supply suitable electric motors.

Among the advantages claimed for these winding, measuring and marking machines are the automatic printing of trade or other marks on goods, thus preventing the misrepresentation of goods or the substitution of others, the printing of the number of each yard in rotation, thus minimizing the possibilities of shortage claims and facilitating the taking of stock.

A number of mills are now using these machines with successful results on a wide variety of fabrics and the manufacturers will be glad to send information as to their use on the product of any mills interested.

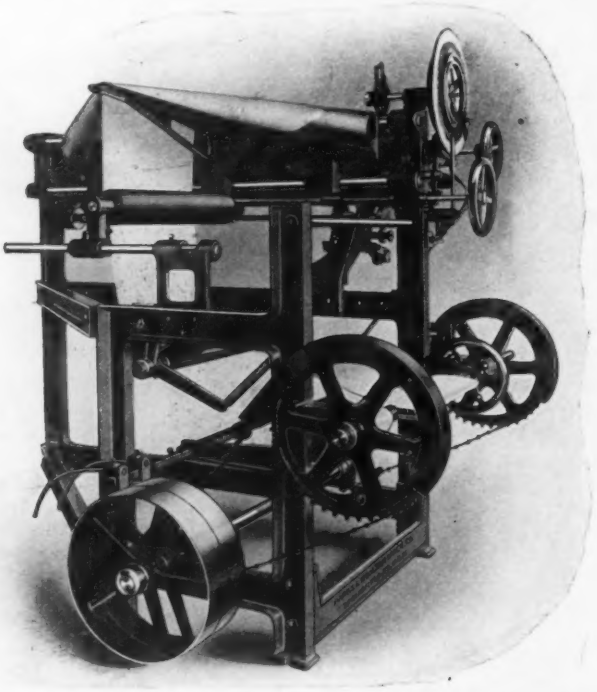
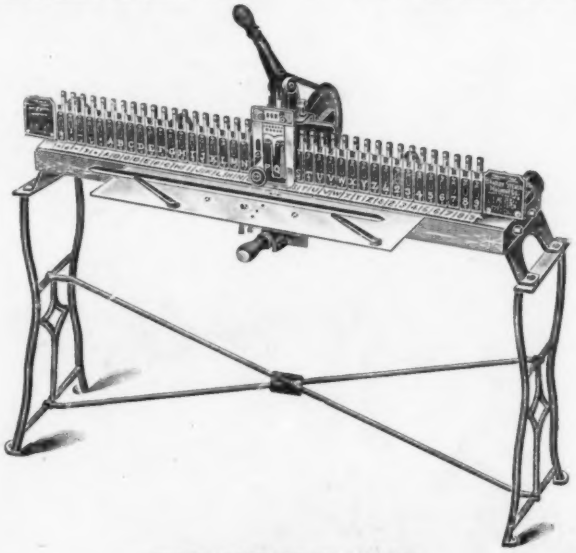


FIG 2. PARKS AND WOOLSON MEASURING AND MARKING MACHINE, MODEL E.

According to the statistics of the Department of Commerce and Labor the United States imported in 1870 raw silk to the value of $583,589; in 1906 these imports were valued at $17,352,021.

THE BRADLEY STENCIL MACHINE.

The recent ruling of the Freight Traffic Association, including all railroads and steamship lines in the United States, to the effect that each individual piece in shipments of less than carload lots, must be marked with the full name of consignee and the destination, or freight will not be received, means a great deal of extra work in the shipping department of all large establishments. This ruling took effect July 1, 1908, and shippers will be all the more interested in the perfection of a stencil machine which



THE BRADLEY STENCIL MACHINE.

does away with the brush and ink pot of the past, thus relieving them of the drudgery incident to hand-work. But more important is the fact that stencils insure legible and accurate marking of boxes, packages, bales, etc., and goods thus marked are not likely to go astray. The investigation of lost freight shows an appalling amount of carelessness in marking.

The Bradley stencil machine, which is here illustrated, enables the shipper to cut a clear, legible stencil in half a minute's time and at a cost of one-tenth of a cent per stencil. Every part is interchangeable and the makers state that it will last a lifetime with ordinary care. It is particularly adapted for the marking of all shipments with the full address, and for accuracy, and time and labor saving, it will appeal to every shipper. Its usefulness has been demonstrated in thousands of establishments including many departments of the United States Government. It is manufactured and sold by A. J. Bradley, 101 Beekman St., New York.

ARACHIDELLE.

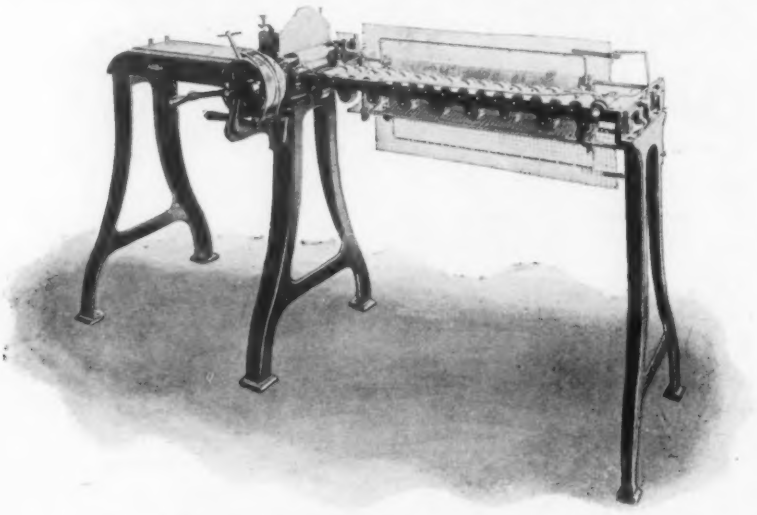
A product for oiling worsted top, which has for a number of years been used in German mills and known as Arachidelle, is now being introduced to the American trade by the Vera Chemical Co., Stoneham, Mass. It is offered as a substitute for the materials ordinarily used for oiling top. The German manufacturers of this product state that it has been prepared in order to overcome the difficulties which German worsted mills encounter in using the various commercial products for oiling worsted. They state that scientific tests of these preparations showed that the most injurious materials had been used, such as rubber, potato starch, soda, soap and low grades of fatty acids. Frequently the bad effects of these materials are not known to the manufacturer who uses them. They reduce the elasticity of the

wool and have an injurious effect on the machinery and leather belting. These materials also cause many difficulties in weaving, piece dyeing and finishing.

The efforts to obtain a satisfactory substitute resulted in the product known as Arachidelle. It is claimed to be absolutely pure, leaving no injurious residue. The natural elasticity of the wool is retained and the yarn takes the sizing uniformly. It is also claimed that the difficulties in weaving, dyeing and finishing caused by impure oil are overcome by the use of Arachidelle. Further particulars regarding this product can be obtained from the American agents, The Vera Chemical Co., Stoneham, Mass.

THE "ROBINHOLD" AUTOMATIC POWER TOP CUTTER.

The illustration shows the latest model of this machine with the addition of an automatic folder for use when cutting tops on misses' and children's hosiery. With this attachment the tops are automatically piled on shelves in dozen lots. As one shelf is filled with twenty-four tops (one dozen pair), another shelf is brought into play and the first dozen can be picked up, tied and laid aside to be used as wanted.



THE "ROBINHOLD" AUTOMATIC POWER TOP CUTTER.

This new attachment overcomes the previous objection raised against cutting these long tops on a machine; viz, that of having them drop in a promiscuous heap upon the floor or into a box which causes them to become tumbled and involves handling in rearranging.

The machine and folder will cut any length up to 36 inches, and requires no adjustment when once set for any given length. If used as a half hose top cutter, it will cut any length up to 9 inches. If used for an 18-inch top, it will cut any length from 9 to 18 inches. If used for a 27-inch top, it will cut any length from 18 to 27 inches. If used for a 36-inch top, it will cut from 27 to 36 inches. When set for any of these different lengths, the machine does not require any further adjustment, as the variation of several inches in the tops will be controlled by the mechanism of the machine.

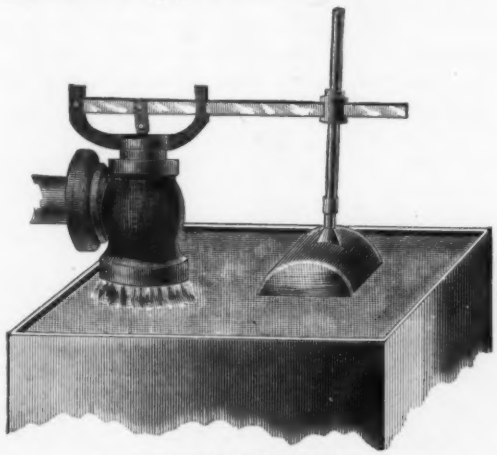
In its original form without the new automatic folder, the machine has been on the market for about a year, and in that time has found substantial appreciation from hosiery manufacturers as shown by the large number of machines that have been sold, and the variety of tops which it cuts. In a number of instances duplicate orders have been received and some mills are now using several machines. Among the advantages claimed for automatic top cutting by this machine are

more uniform cutting than by hand, less waste of material and a great saving of labor.

At the recent exhibit held in connection with the Knit Goods Manufacturers' Convention in Philadelphia, the new model was exhibited and attracted great attention and much favorable comment. It is manufactured and sold by the Robinhold Machine Co., 650 North Eighth St., Reading, Pa.

THE KELLOGG FLOAT VALVE.

The illustration shows a new style of float valve, which has been tried out for some time in Holyoke and vicinity, and has proved itself very efficient, giving entire satisfaction in several instances where other makes had failed. Quite recently the patterns and right to manufacture the Kellogg Float Valve were purchased by Messrs. J. & W. Jolly, Inc., of Holyoke, who will give it a wider market, having proved its value.



THE KELLOGG FLOAT VALVE.

The distinctive features of this valve are first, that the water pressure is balanced so that it operates very easily, and a smaller valve of this type can be used than would otherwise be required; second, and most important, is that this valve cannot fail to operate, as there are no adjustable packings for the mechanic to tighten up to the sticking point. Every mill owner who has had this happen and his mill flooded and goods damaged from an overflowing tank will appreciate this feature.

The illustration shows the simplicity of the device, and the manufacturer will be pleased to furnish additional information desired.

TOOLS FOR USE WITH RENOLD SILENT AND ROLLER CHAIN.

The introduction of Renold chains to American trade was an event which has been of appreciable importance to the manufacturers of all classes of machinery in which the method of power transmission figures.

As shown by Fig. 1, two semi-circular

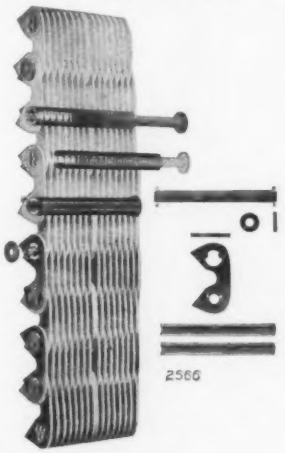


FIG. 1.

bushings are used in each joint, both being of a length equal to the width of the chain. This new arrangement besides allowing for the proper articulating movement, permits complete rotation of the pin. This is of decided value, inasmuch as possible wear is thus rendered free from unevenness, while the accuracy of fit minimizes any tendency to elongation with its accompanying wobble. Another point made in favor of the new construction is the absence of contact between links and pin, which relieves the latter of concentrated pressure and eliminates the internal wear so destructive to proper service.

In the process of installing the chain drives, the makers revised special appliances to facilitate the work of connecting the links.

Fig. 2 shows what is termed a "cramp," a specially designed holder made of cast iron

members for gripping the ends of the chain, and connected by a screw for drawing the gripped ends together when fastening them.

The device shown at Fig. 3, termed a fork

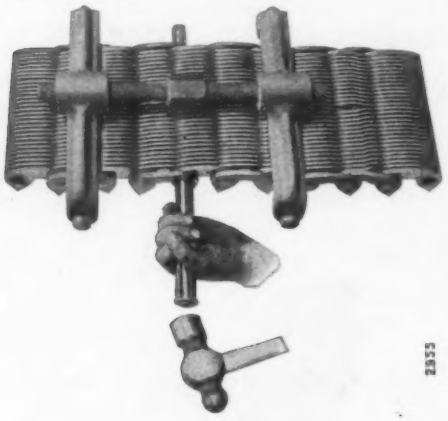


FIG. 2.

and anvil, is used exclusively with the roller type of chains. With it these may be handled very easily, as it was only necessary to slip the forked part between the rollers, with the lower part of the links hanging into the channel of the anvil block. Release of the links may be made quickly by slipping the fork off the anvil. These tools are of a size that makes them easily portable, a feature that will commend them to users who have occasion to lengthen or shorten drives, or otherwise make changes in the chains. A punch and chisel are included in a kit. The Renold chain is manufactured by the Link-Belt Co., Philadelphia, Chicago and Indianapolis.

THE HOLTZER MAGNETO WATCHMAN'S CLOCK.

The cost of overseeing labor, to insure the proper performance of work, figures up to a very appreciable percentage of the total labor cost. Yet it pays. Some classes of employes can be given personal attention during the performance of work by those who are responsible for results or who will suffer by the non-performance of work. On the other hand, other classes do not lend themselves to this arrangement so readily, and the recording of the service of the employe must be done by a mechanical or electrical device and this record examined by the person in charge at some later time, or no supervision or control be exerted over the employe.

In the case of a watchman, the possible loss to his employer is too great to take chances on the conscientious or careless performance of duties and in most cases the only practicable method of checking up the efficiency of the watchman is by a device which records his visits to the stations on his route. This form of supervision gives the highest degree of safety at minimum cost.

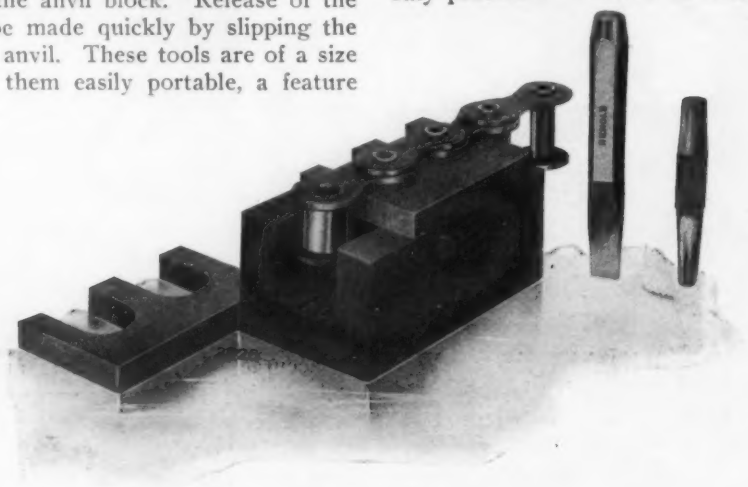


FIG. 3.

The illustrations show a new style of

Holtzer Magneto Clock and Station manufactured by the Holtzer-Cabot Electric Co.

FIG. 1. STYLE E.

of Brookline, Mass., for recording the time when the watchman goes over his route. Its record is an ineffaceable puncture on a paper dial, the mechanism being operated by current from small magneto generators, similar to those used in telephone service, which are arranged along the route of the watchman. No batteries are used. Fig. 1 is the clock assembled ready for installation in the office or other suitable place. Fig. 2 is a magneto station to be located at any point along the watchman route, the turning of the handle making a record on the dial in the clock. Fig. 3 shows the operating mechanism of the clock. Any number of stations, up to 30, may be used with a single clock.

The simplicity of the mechanism is at once apparent. All brass parts are polished and lacquered and the armatures and iron parts are copper plated to prevent rusting. The magnets are wound with a silk covered wire in even layers. The wiring is very simple, requiring a common wire connecting the clock and all the stations and an individual wire to each station. The clock movement is thoroughly reliable and the dials can be quickly and easily changed. Recorders are usually furnished with a year's supply of 12-hour dials, but the manufacturers are prepared to supply 24-hour dials if desired.

The Holtzer-Cabot Magneto Clock is recommended by the Standard and Mutual Insurance Companies and is endorsed by National Fire Insurance Underwriters. No manipulation of the magnetos or short circuiting of the wires can destroy the record

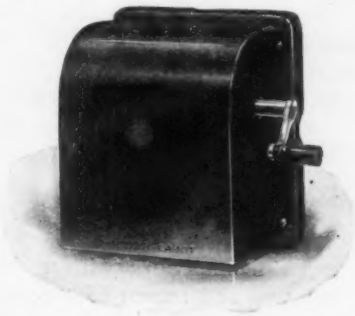


FIG. 2.

of a watchman's work, and the construction makes the failure to make a record practically impossible

Every detector is fully tested before leaving the factory and goes out working perfectly and guaranteed for a period of five years against mechanical defects. Complete information of the provisions made for installations under all conditions will be given by the manufacturers.

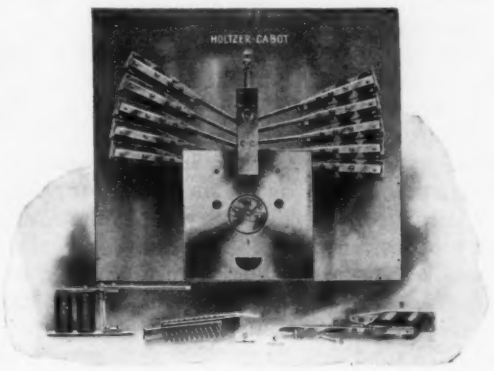


FIG. 3.

In order to prepare the cocoanut fiber the unripe nuts are steeped in sea water for several months, in fact until the flesh has begun to putrefy, whereupon the fruit is beaten, stamped, and washed with water. The residual red-brown fibrous material is divided, by tearing and hackling, into fibers about 10 inches in length, which are worked up into cord, string and brushes.

Dyeing, Bleaching, Printing, Etc.

EFFECT OF TEMPERATURE AND DILUTION OF DYE BATH IN DYEING WOOLEN YARN.

BY ELMER C. BERTOLET,
Winner of the Textile World Record Gold Medal, Philadelphia Textile School.

The experimental work with which this paper deals was undertaken with the view of ascertaining as far as possible the effect of the temperature and dilution of dye bath on the depth of shade obtained and on the evenness of the dyed yarn. In considering this subject no reference is made to those dyes which are applied in a special manner, such as alkali blue or indigo. The dyestuffs most important to the wool dyer, as regards fastness to washing, scouring or fulling are the only ones with which experiments were conducted. The methods of dyeing wool differ considerably from those employed for cotton and other vegetable fibers. In comparing wool with cotton it is well to know that the former has greater affinity for most coal tar colors which dye without the use of a mordant, while cotton can only be dyed directly with the substantive sulphur and a few fugitive acid dyes. Before going into the subject of the dyestuffs used on wool, a study of the chemical properties and nature of wool fiber will not be out of place.

First, the action of acids on the wool fiber. The wool fiber has great affinity for dilute acids, absorbing them from solution and holding them so firmly that boiling with water will not remove the last traces. Wool so treated can be applied to acid dyes in a neutral bath, which otherwise would require a large amount of acid. This explains why shoddy obtained by carbonizing with mineral acids will dye a deeper shade than the wool fiber itself. Dilute acids have very little, if any, effect on the strength, elasticity, and luster of the wool fiber. With alkalies in general the wool fiber is greatly deteriorated both in strength, elasticity, feel and appearance. This is an important point and will be dealt with later under the head of scouring. Lanuginic acid, one of the decomposition products of wool, obtained by boiling with barium hydrate, is an interesting compound. It is an amids compound of

ELMER C. BERTOLET, WINNER OF THE TEXTILE WORLD RECORD GOLD MEDAL.

keratin, the proteid contained in the wool fiber. Its aqueous solution acts like wool, forming highly colored precipitates with acid and basic dyes and also with the various mordants. When heated above 100° C. lanuginic acid swells up, turns brown and gives off an odor similar to that of burning wool. I mention this because the property of lanuginic acid to form insoluble compounds with coloring matters and mordants the same as wool fiber itself, shows that the dyeing of wool may be dependent on the presence of this substance in the fiber, and that wool has both the properties of an acid and a base. The presence of the base (amids groups) is proved by the combination of the acid dyes

and dilute acids with the wool fiber. By treating wool with strong caustic soda (80° Tw.) it has less affinity for basic dyes. This is probably due to neutralization of some of its acid constituents.

The dyeing of woolen yarn takes place in two stages:

1. Scouring of the yarn.
2. Dyeing of the yarn according to various methods.

Scouring of the Yarn. Before dyeing, the wool must be free from all oil, grease and dirt contracted in the manufacture of yarn. When wool is carded and spun, it is necessary to add a certain amount of oil to the stock in order that the material may not be injured in the mechanical processes through which it passes. To woolen yarns, as a rule, a much larger amount of oil is added than to worsted yarns, and the oil is usually of a different character. An emulsion of olive oil and ammonia is mostly used for worsted yarn. Nearly all yarn will contain varying amounts of iron mixed with the oil and dirt. This is from the wearing of the metallic parts of the cards and spinning frames through which wool passes in the course of manufacture. The secret of even dyeing depends a great deal on the condition of the scoured yarn and the complete removal of all foreign substances is, therefore, a very important step.

The oil used in spinning consists of an easily emulsifiable oil and is usually removed by a soap solution with a certain amount of carbonated alkali. As a rule the bath for scouring consists of from two to four ounces of soap and one-half to two ounces of sodium or potassium carbonate per gallon. A temperature of 120° to 140° F. is best for the scouring of wool; for yarns liable to felt, the temperature is kept below this. The scouring of single worsted yarns, which are liable to felt, is best carried out in a 1 per cent. bath of ammonia at a temperature of 100° F. Ammonium carbonate can be used instead of ammonia. Ammonia does not cleanse the yarn as well as a soap solution and if any iron is present it is fixed in the yarn, giving it a brownish tint instead of a pure white obtained by soap. Good results can be obtained in the scouring of two-ply worsted yarn of fine count in a bath of two to four ounces of soap and one-quarter to one-half ounce of ammonia per gallon. The soap alone can be used and the results obtained are nearly equal to those obtained by the use of soap and ammonia.

For worsted yarns the temperature of the above bath should be 110° to 130° F. After scouring, the yarn is rinsed in a bath of warm water, and then in a bath of warm water and ammonia, with enough ammonia to make the bath smell of it, finally rinsing in a bath of fresh water. The after-treatment with ammonia is of great use in removing any adhering soap which would cause uneven dyeing by impending the entrance of the dye.

In the above operation a neutral olive oil, potash soap is used. It is well known that, although alkali carbonates are employed in conjunction with soap, and on some classes of yarn, a large excess of alkali is used, superior results are obtained by soap solutions unaided by alkali. Soap appears to effect the complete emulsification and consequent removal of the grease, dirt and iron present in woolen yarns, and the baths used are not as concentrated and the temperature not as high as when solutions of soda ash and ammonia compounds are used. Soap appears to be the only scouring agent among those in common use that will eliminate all traces of iron from wool. If in using soda ash, iron is present, the wool will be of a brown color, owing to the formation of an insoluble iron oxide which in subsequent dyeing yields dull shades.

2. Dyeing of the Yarn. After a complete scouring, the yarn is ready for the mordanting or dyeing. It is very essential that previous to introducing into dye bath, the wool should be thoroughly wet out by passing first through hot water, then through cold water and then squeezed or allowed to drain, in order to insure an even dyeing. However, there should not be too much water in the skeins or the dye will not penetrate the wool evenly. The well wetted-out goods are entered in the dye bath at a temperature best suited for the particular class of color used. The dye bath for dyeing woolen yarn generally consists of from 50 to

60 times the weight of the water as material to be dyed. One pound of yarn will require 7.5 gallons of water. The percentage (based on the weight of material) of color and chemicals is also added to the bath. A study of the application, temperature and dilution of dye bath for acid dyes and various mordant colors will now be made.

Dyeing Wool with Acid Colors. The process most commonly used is to dye the wool at a boil in a bath containing 2 to 4 per cent. sulphuric acid and 20 per cent. Glauber's salt and the required amount of dyestuff. The Glauber's salt is added to the bath to prevent uneven dyeing, to a certain extent, with dyes that exhaust too rapidly. Its action seems to be purely physical, causing the dyestuff to go on the fiber evenly and slowly, because its molecules interfere with the molecules of the dyestuff. The commercial acid dyestuff consists of the alkali or lime salts of the color acid. When treated with sulphuric acid the free color acid and sodium sulphate are formed.

The free color acid now combines with the base of the wool and causes the fiber to be dyed. Many different ways of applying the above method are used. Some put the wool into a warm bath of the color and Glauber's salt, raise to a boil and gradually add sulphuric acid to the boiling bath in small portions, turning the yarn all the time. This is liable to give uneven shades, as the wool does not dye very heavy before adding the acid, and as the temperature of the bath is at a boil, the color will exhaust too rapidly. A better way is to make up dye bath with necessary dyestuff, Glauber's salt and acid. Start cold and enter the well wet-out yarn in this bath. If slight unevenness occurs, work until even and then slowly raise to a boil within 45 minutes. This method works very well, but to get the best results with acid dyes the yarn must be worked continuously and there is much danger of felting.

Effect of Temperature of Dye Bath in Dyeing Acid Colors. In this work six acid colors made up of two yellows, two reds and two blues were selected at random from a large list of colors. The work was carried out with the following colors:

Tartrazin (K. & P.), Milling Yellow O (Cassella Color Co.), Azo Fuchine (Farbenfabriken Co.), Wool Red B (Cassella Color Co.), Formyl Blue B (Cassella Color Co.), Wool Blue 2B (Berlin Aniline Co.).

The dye bath was made up of 300 c.c. water, 20 per cent. Glauber's salt, 4 per cent. sulphuric acid and 3/4 per cent. dyestuff. Small porcelain beakers which can hold about 350 c.c. water were used for tests. Dyeings were made on 75 grain skeins of 2/28s worsted yarn, well scoured and wet-out, in the above mentioned baths for one-half hour at the following temperatures:

1. In the cold or about 60° F.
2. At 120° F.
3. At 180° F.
4. At the boil (212°).

The conditions of dyeing, save for the temperature, were kept as equal as possible. A water bath was used to maintain the temperature at 120° F. and at 180° F. The skeins were entered in the bath of dyestuff acid and Glauber's salt at temperature given above and no effort was made to carry out the dyeing as described under the "dyeing of wool with acid colors."

In the cold the dyeing does not exhaust more than one-sixth of the color from the dye bath. This is found out by a comparison of the six colors, but the degree of exhaustion is not near the same for all the colors. As the dyestuff goes on the fiber very evenly it is seen that this is the best temperature for starting the dyeing and obtaining a level bottom. As the temperature of the starting bath goes up, the color exhausts more and more as it reaches the boil. At 120° F. the shade is more than twice as deep as that obtained in the cold and the dyeing is also very even. At 180° F. the shade reaches near its maximum depth for 3/4 per cent. of dyestuff, though the color obtained at 212° F. is slightly darker and brighter. This brightness is due either to the increase in depth or perhaps to better penetration of the dye into the fiber. The dyeings at 212° F. and 180° F. did not come up as uneven as was expected. This was probably due to dyeing of a single color and not of a dyestuff which was a mixture of dyes that had different degrees of exhaustion.

In comparing the shades of the six colors, all except Tartrazin seemed to work nearly alike. Tartrazin has good exhaustion in the cold and at 120° F., while at 180° F. the color exhausts completely from the bath in 12 minutes. At 120° F. the shade obtained was nearly as dark as that obtained at the boil. Milling Red, Milling Yellow and Formyl Blue were not dyed as deep in the cold as the other three colors. The exhaustion of the colors experimented with at the boil was compared at the end of ten minutes. Formyl Blue Black Azo Fuchine slightly colored the bath, but the condition did not change on subsequent boiling at the end of 30 minutes. The other four colors exhausted almost perfectly in ten minutes.

Dilution of Dye Bath in Dyeing Acid Colors. The same six dyestuffs used under temperature tests were used in this work. The dyeings were carried out at the boil on 37 1/2 grains worsted skeins with the following amounts of dye liquor. Sixty times the weight of water as material is regarded as right for dyeing.

1. Twice the dilution or 120 times weight of material.

2. Three times the dilution or 180 times weight of material.

3. Five times the dilution or 300 times weight of material.

The dilution of the bath does not count for as much in the dyeing as in the temperature. Twice dilution or three times dilution is about the limit used on a practical scale, while five times dilution is rarely used except for exceedingly small lots. Only a small difference is noticed between the use of 60 times the weight of water and 20 times weight of water, twice diluted. The difference between twice and three times dilution is about the same as between the right amount of water and twice the dilution, though a shade is obtained which is a trifle darker than that obtained at 180° F. under the temperature tests. Although a dilution of five times is seldom reached, interesting results were obtained. All the colors seemed to change their tone, the yellows and reds turned dull and the blues to a greener cast. This I cannot explain, as the exhausted baths did not seem to look any different from the others, but it is seen that some of the red of the color is lost. Azo Fuchine suffered the most change, going from a bright bluish-red to a dirtier, greener red. The depth of shade obtained at this dilution is about the same as that obtained at 180° F. under the temperature tests.

The dilution of the dye bath would not have such a bad effect if the colors did not change, but when dyeing standard shades on a large scale, a loss of dyestuff and a corresponding loss in depth of shade would result. This would necessitate more time in toning up a shade that is light. One favorable result from the use of dilution is that it takes a little while longer to exhaust color than when the usual amount of water (60 times weight of material) is used. But as this point can also be regulated, to a certain extent, by the addition of Glauber's salt and a smaller amount of acid, it cannot be counted as being of much importance.

The Temperature and Dilution in Matching-off Fancy Shades. The skeins were dyed with 3/4 per cent. of dyestuff made up of 1/4 per cent. of red, 1/4 per cent. of yellow and 1/4 per cent. of blue. The six colors were worked in all possible combination so that each color was represented once in combination with each other color. Increase in temperature exhausts the baths much the same as in the dyeing of the straight color, but if three colors are associated together that have marked differences of exhaustion, uneven shades will nearly always result, unless the yarn is worked very rapidly. The shades obtained seemed very level and better results can be obtained if the dyeing was started cold. The dilution of the dye bath is a very serious drawback, as it alters the shade in both depth and tone. The way the colors work together with reference to evenness is hard to determine in an experimental way, although I know from experience that acid dyes are difficult to dye level. Wool Red, Milling Yellow and Formyl Blue gave good results when dyeing lots in a kettle.

Application of the Mordant Dyes. Under this head is included the Alizarins, Acid Alizarin and the Anthracene dyes.

1. Dyeing Alizarins. These are applied

to the fiber on a mordant, usually derived from potassium dichromate by action of tartar and partly by the action of the wool fiber itself. The use of organic acids or acid salts, such as lactic acid, formic acid, oxalic acid and tartar, along with the chrome, gives brighter shades. The mordanting bath is prepared with 2 to 4 per cent. potassium dichromate and 2 to 3 per cent. tartar and the wool is boiled in this for one hour, well washed and is ready for dyeing. Small amounts of chrome do not have much effect on shade, but an excess gives rise to dull shades, due to its action on the fiber and on the dyestuff. Only about one-third of the chrome is taken from the bath.

The chromic acid goes to the fiber, giving it its yellow color, and the potassium chromate remains in the bath. During the dyeing the chromic acid is reduced partly by the dyestuff used and partly by the wool fiber, whereby it is converted into chromium sesquioxid, which is the mordant proper.

The dyeing is started cold in a neutral or faintly acetic acid bath and the material entered at from 70° F. to 120° F., according to the depth of shade. The bath is slowly raised to a boil within an hour and if not exhausted an addition of acetic acid is made and dyeing continued. When so dyed the alizarins give even shades and good penetration. These colors are valuable because they can be built up and the shade obtained without the after-chroming which changes the tone of the colors to a great extent. The presence of iron in the mordanting or dye bath gives dull shades.

Allowing the mordanted yarn to stand unevenly exposed to light leads to the producing of uneven shades. The reason for this is thought to be due to the uneven reduction of chromic acid to chromic oxide.

Effect of Temperature in Dyeing Alizarins. The experiments were carried out at the same temperature as under the acid dyes. Skeins, weighing 37 1/2 grains each, mordanted with 1/2 per cent. chrome and 1/3 per cent. tartar for one-half hour at the boil, were used. Sixty times the weight of water as material taken was used in the dyeing, together with 3/4 per cent. dyestuff and 2 per cent. H_2SO_4. Dyeing was continued for one-half hour. The colors used were:

Alizarin Yellow A W (K. & P.), Alizarin Red S W (K. & P.), Alizarin Blue B N (K. & P.), Alizari Green C (By.), Alizarin Brown S O (K. & P.).

These dyes as a class exhaust much the same as the acid dyes, the depth of shade at the different temperatures being somewhat alike. In the cold the exhaustion of the baths was poor, but, being slow, an even bottom was obtained. At 120° F. no baths were exhausted, the yellow and green giving the heaviest shade. At the end of 20 minutes and at 180° F. Alazarin Green left only a tint of color in the bath. The yellow also was almost completely exhausted. The Alizarin Brown at this temperature gave a fuller shade than at the boil, due to some of the yellow holding off till the boil is reached. At the boil the green exhausted perfectly in 15 minutes, while the yellow was no better than at 180° F. With the other colors, although the exhaustion was not perfect, an equilibrium of the dye bath took place and after 15 minutes no more color appeared to go on the wool. At the boil the yellow and green seemed no darker than at 180° F., while the other colors had a slight increase in depth. The colors also give brighter shades at the boil and as the alizarin dyes are apt to change their tone at the different temperatures, the boil must always be reached before the dyeing is completed. The yellow and green did not change much at the different temperatures. The red came up orange at 120° F., although at 180° F. it changed to a bluish-red. The blue is a redder shade at 120° F. than at 180° F., although the bluish shade is obtained at the boil. From this it is seen that the colors are hard to use, except to an experienced person, in matching off a color on account of the large amount of secondary color which they contain. In many instances the acid and acid alizarins must be used to tone up a shade that has gone dull. Starting the dyeing at 180° F., or at the boil, gives uneven shades and it is, therefore, extremely hard to tone up a color which is off shade without first cooling the bath.

(To be continued.)

THE STRENGTH OF CAUSTIC LIQUORS FOR MERCERIZING COTTON WARPS.

BY LOUIS J. MATOS, PH. D.

The proper strength of solution to employ for the purpose of mercerizing cotton was a matter of considerable conjecture in the early days of the art, and it was not until many experiments, more or less costly, had been made, that some approximation was reached to that strength which appeared to yield the best results.

Like every new process, of which every worker in cotton was exerting his utmost endeavors to uncover the hidden secret, the wildest rumors were spread broadcast regarding the details and were eagerly snapped up, hurriedly tried, and almost as promptly rejected, few operators being painstaking enough to go deeply into the matter, and endeavor to reason why the trials made failed.

Everyone knew that caustic soda was the magical liquid, but the difficulty was to discover at what strength it was employed by the other fellow, without endeavoring to determine this most important matter by one's own efforts. The question of temperature was also an important matter, which also required several years to fix definitely.

At the present time, however, it is a pretty well established fact that an average strength of caustic soda solution best suited for the purpose, is about 65 degrees Tw., equal to a specific gravity of 1.33, and corresponding to a percentage strength of 30.38 Na_2O. This strength is fixed as being the best after a long series of trials with the process, and after many apparent setbacks. While certain local conditions may influence it to some extent, yet it is the one mostly employed.

PREPARATION OF THE CAUSTIC LIQUOR.

To prepare a solution of caustic soda of given strength is a matter of little difficulty. All that is required is to dissolve the caustic in a suitable quantity of water, usually somewhat less than the exact amount actually needed, and afterward dilute to the proper strength by the addition of water. The one difficutly met with is the proper means of dissolving the caustic. All things considered, the easiest appears to be to cut out the end of the caustic drum, and insert it over the iron solution tank, and effect the solution through the agency of steam, blown directly against the fused contents. The first result of this action is a very strong solution of caustic which must be reduced to the proper degree for economical use. Usually, the iron solution-tank has a measuring stick graduated into "gallons," and with this the quantity of strong solution is ascertained. With the aid of a Twaddle glass or specific gravity hydrometer the density is found. From these particulars the proper quantity of water to add to reduce the strong solution to its correct strength is calculated in the following manner:

Suppose the strength shown by the glass is 86° Tw. (or 1.43 sp. gr.), the quantity in the tank is 125 gallons, and the strength to be reduced to is 65° Tw. or 1.325 sp. gr. Subtract the lower gravity from the higher gravity, and multiply the difference by the number of gallons to be diluted, and divide this product by the lower gravity minus 1. Example:

1.430 High gravity in tank
1.325 Low gravity for use

.105 Difference
125 Gallons in tank

13.125

13.125 ÷ .325 = 40.4 gallons to be added.

The following table will be found of special interest in making up solution of caustic soda for mercerizing. It ranges from 1° to 80° Tw. in periods of 5 degrees, while the strengths from 60° to 70° Tw. are given for each degree:

TABLE OF THE STRENGTH OF CAUSTIC SODA SOLUTIONS.

Degrees Twaddell	Specific Gravity	% of Sodium Oxide (Na_2O)	% of Caustic Soda (NaOH)	Oz. of "60%" Caustic Soda per U. S. Gallon
1	1.005	.37	.47	.83
5	1.025	1.88	2.42	4.18
10	1.05	3.77	4.86	8.36
15	1.075	5.71	7.16	12.67
20	1.10	7.65	9.86	16.96
25	1.125	9.6	12.38	21.26
30	1.15	11.86	15.29	26.30
35	1.175	14.13	18.22	31.31
40	1.20	16.40	21.15	36.34
45	1.225	19.09	24.62	42.21

50	1.25	21.78	28.09	50.40
55	1.275	24.55	31.66	54.41
60	1.30	27.32	35.24	60.55
61	1.305	27.93	36.03	61.89
62	1.31	28.54	36.81	63.26
63	1.315	29.15	37.6	64.60
64	1.32	29.77	38.4	65.97
65	1.325	30.38	39.19	67.33
66	1.33	30.99	39.97	68.68
67	1.335	31.60	40.76	70.04
68	1.34	32.22	41.56	71.39
69	1.345	32.83	42.35	72.75
70	1.35	33.44	43.13	74.12
75	1.375	36.65	47.27	81.22
80	1.40	39.85	51.40	98.32

The choice of a grade of caustic soda is a matter of some consequence, and it is a mistake to assume that a low or cheap grade will answer equally as well as a high grade. Caustic soda is valued according to the amount of oxide of sodium which it contains, and is sold in several strengths, the highest being about "77° caustic," while the lowest is known as "60° caustic."

Some confusion exists as to the meaning of the terms sodium oxide, sodium hydrate and caustic soda. Sodium oxide or alkali is the chemically active ingredient which is of the utmost value, and it is the quantity of this substance that fixes the price of both caustic soda or soda ash. Its chemical composition is Na_2O. Caustic soda is the hydrate of soda, and is the result of a combination between the oxide and water, forming NaOH. Seventy-seven and a half (77.5) parts of sodium oxide are equal to 100 parts of caustic soda (or hydrate). From this it is readily seen that an alkali of 76-77 per cent. is practically as strong as it is possible to procure it and is nearly 100 per cent. pure hydrate.

For mercerizing cotton, the best results will always be obtained if a 76-77 per cent. caustic is used instead of a "60 per cent." grade. Care should be taken not to place too much reliance upon the readings of the hydrometer or Twaddle glass, but to be governed by the accurate method of estimating the alkali strength by means of standard acid.

One of the most prominent reasons for using a 76-77 caustic is that during the process for producing alkali of such a strength, nearly all impurities including iron are removed, the presence of which has tended to discolor the mercerized cotton. Comparing the relative values of commercial caustics of various strengths, the annexed table shows that for a given result, the weakest is the least economical:

76-77% Caustic ..... lbs. 100
74% Caustic ..... lbs. 107.5
70% Caustic ..... lbs. 109.28
60% Caustic ..... lbs. 127.5

In other words, 127 1/2 pounds of "60%" are required to do the work of 100 pounds of "76-77%."

THE MERCERIZING OPERATION.

As applied to warps, the usual method is to pass them through a series of baths, commencing with a preliminary wetting out in a very weak caustic soda solution (or preferably by passing through a bath heated to 160° to 170° F., containing soluble oil which removes completely all oil and grease), then through a plain boil, followed by a passage through cold water; then pass through the caustic soda solution; now give two washes to effect the removal of the major portion of the remaining alkali; then through a weak sour to neutralize the last trace of soda, followed by two washes, and a final soap.

In passing from one bath to another, the warps should pass through heavy squeeze rollers, especially upon coming out of the alkali bath. The soda bath should be kept up to its initial strength by the regular addition of caustic soda. In order to do this most expeditiously and accurately, the condition of the caustic bath should be known at any time during the process. Take, for example, the problem of mercerizing three thousand pounds of warps, where the mercerizing (or alkali) tank has a working capacity of 300 gallons of caustic liquor of 65° Tw. By reference to our table above, we find that this will contain at the beginning of the run nearly 4 1/5 pounds of caustic per gallon, or a grand total of 1050 pounds.

It has been determined experimentally, and with great accuracy that cotton warps or skeins when well wetted out and squeezed as nearly perfectly as powerful squeezing rollers are capable of doing it, still contains an equal weight of water, that is, 100 pounds of warps will contain 100 pounds of water, or 12 gallons; consequently, in the passage of

our 3000 pounds of warps through our 300 gallons of caustic bath, we must allow for its dilution with 3000 pounds of water or 360 gallons, by adding an amount of caustic soda to maintain the strength, and this would be 1516 pounds, or very close to 50 1/2 pounds of fresh caustic for each 200 pounds of wetted warps entering the mercerizing bath. These figures are based upon the solutions being used at their ordinary temperature.

These figures reduced to their simplest form imply that the original strength of the alkali solution is maintained by the employment of a quantity of caustic soda calculated upon the amount of water mechanically taken into the bath with the warps.

Reference is made above to the proper method for determining the strength of the bath. If mercerizers would adopt the system of making use of the chemical method, and determine the actual amount of alkali by means of standard acid, they would never go back to the use of the unreliable hydrometer.

Several solutions are required, and are as follows:

1. A solution of pure sulphuric acid containing 49 parts acid per 1000 parts (1/2 gallon at a time).
2. A solution of pure caustic soda containing 31 parts per thousand (1/2 gallon at a time).
3. A solution of litmus (1 ounce).
4. A dilute solution of nitrate of silver (1 ounce).
5. The following pieces of apparatus:
   - One 10 cc. pipette.
   - Two 50 cc. burettes.
   - Two 200 cc. beakers.
   - One porcelain plate.
   - Several glass stirring rods.
   - A tripod and ring.
   - Several pieces of wire gauze, 4 in. sq.
   - One Bunsen burner.

TO MAKE THE TEST.

With the pippette, take 10 cc. of the caustic liquor to be tested, and dilute in a beaker with 100 cc. of distilled water. From a burette, run in the standard acid, drop by drop, stirring all the time. From time to time take a drop of the liquor from the beaker on the end of the glass rod and test on the porcelain plate with a drop of the nitrate of silver solution, until a drop ceases to show a brown coloration. The precipitate will be white when all the caustic is neutralized, and when this point is reached, the number of cc. of acid consumed is read off. When multiplied by .31 this gives the percentage of soda as caustic contained in the liquor.

To determine the amount of carbonate of soda present, and which is due to exposure or as an impurity, take the solution remaining in the beaker and add a few drops of the litmus solution, and an excess of the standard acid, noting the quantity added, then boil for a few minutes, and from the second burette, run in, a drop at a time, the standard solution of caustic soda until the liquid is turned blue. The number of cc. of acid minus the number of cc. of caustic multiplied by .31 will give the percentage of soda as carbonate, and which will usually be small.

This method of estimating the strength of caustic liquors is absolute, and errors are not likely to occur if the standard solutions are properly made. By such a method of testing the value of any lot or delivery of caustic will also be under control, and money values will be safeguarded.

The coal tar industry is controlled by Germany. Considering the foreign trade alone of that country, the value of the chemicals exported from Germany in 1905 was $131,395,500, of which the artificial dyestuffs, valued at $48,665,000, constituted nearly 40 per cent. Among these were included aniline dyes, valued at $24,065,500, and alizarin and indigo, valued at $9,733,000.—U. S. Census.

Jute, or Calcutta hemp, which has been known in Europe since 1795, and used in spinning since 1830, is obtained from the bast of the Jew's mallow or jute plant, and grown from seed. The plant is largely cultivated in warm, damp Asiatic countries as a vegetable and fodder plant, especially in British India, Calcutta being the principal shipping port.

A PATENT INDIGO VAT.

A French process of dyeing indigo, recently patented in this country, is described by the patentee as follows:

This process consists in treating with an electric current, while protected from the air, a bath of alkaline or alkaline earthy salts, such as carbonates, sulfites, bisulfites or sulfids, employed either alone or in the state of mixture, and in particular, carbonate of soda. The anode at which the current enters the bath is carbon or a metal which is not oxidizable under the conditions of the operation. The cathode is formed in the manner hereinafter described, from a special mixture.

In order to form the cathode powdered indigo blue is taken. As in the fermentation processes this powder should be reduced to an impalpable state. The indigoin powder is mixed intimately with powdered graphite or a metallic powder which is a conductor of electricity, and by any appropriate means, such as molding or otherwise, a cathode is produced the form of which will depend upon the form and dimensions of the vat employed. For example, as an industrial process the mixture of conducting powder and indigoin powder may be packed in a bag around a metallic or carbon conducting core. The two powders might likewise be agglomerated by any suitable substance.

The bath of alkaline or alkaline earthy salts, such as carbonate of soda for example, being placed in an appropriate vat, there is arranged above the level of the liquid, with a view to preventing any contact with the atmosphere, either a stratum of an insulating liquid such as oil, or an insulating atmosphere, such as carbonic acid. The anode and the cathode described above should be introduced into the bath before this takes place. The anode may be placed inside a diaphragm.

Under the influence of the electric current oxygen is produced at the anode and this should be disposed of in any convenient manner, for example by suction in the chamber formed by the diaphragm around the anode; if the bath contains sulfids or sulfites the diaphragm is not necessary as the oxygen is absorbed by the bath. On the cathode, on the other hand hydrogen is formed; this reduces the indigoin into indigo white soluble in alkali which is produced at the cathode in exactly the proper quantity for dissolving the indigo white.

In proportion as the indigo white is dissolved in the alkaline solution of the bath, which is more or less caustic, there forms in the chamber constituted by the diaphragm around the cathode, conducting powder which is disaggregated from this cathode. This conducting powder is subsequently removed and in any case does not enter the vat which contains the liquid really utilizable for the indigo vat. In this manner a solution of indigo white in the more or less caustic alkaline salts of the bath is thus obtained very speedily, the proportion being very high. The liquid thus obtained may be prepared on the spot and be used at once for dyeing; or it may be drawn off protected from the air and preserved indefinitely in receptacles which are either soldered or closed in any other hermetic manner.

This novel process permits of preparing in advance and in very large quantities the liquids required for the formation of the indigo vat. Again, generally speaking, among the numerous advantages presented by the process forming the object of the present invention, the following may be cited: 1. This process permits of forming an indigo vat in a few hours while the fermentation processes hitherto employed necessitate a very long time and constitute excessively delicate operations calling for careful surveillance. 2. By this process solutions are obtained which contain nothing but indigo white and the quantities of more or less caustic alkaline salts necessary for dissolving this indigo white. 3. Far more concentrated solutions are obtained than by what are termed the fermentation processes. 4. It is possible to preserve the indigo solution indefinitely in a closed vessel and consequently to place this solution on the market for use in dyeing. 5. The bath obtained is perfectly homogeneous and its employment in dyeing piece goods gives excellent results as regards the uniformity of the shade obtained. 6. It is very economical. 7. The

bath does not contain any foreign body and consequently gives a remarkable richness of tone.

Steam in Dye Vats.

Editor Textile World Record:

We use a large quantity of black sheeting which we buy in the grey and have dyed elsewhere, but are now making arrangements to dye it ourselves. For this purpose we bought a dyeing machine, in which the goods enter at one end, running over and under rolls in the dye box in order to keep the goods in the dye as long as possible, and finally out between two heavy rolls, one brass and the other rubber, to squeeze out the surplus dye. We run the machine very slowly and keep the dye boiling all the time with live steam, but find this steam weakens the dye considerably, so that the goods come out lighter in shade as the day advances, because of the water from the steam. Kindly advise us if there is some way we could remedy this. We use steam at a pressure of only 50 pounds as we run no engine. Possibly the steam is not as dry as when high pressure is used.

Nelson (998).

This is a very easy trouble to remedy. It makes no difference if the steam pressure is low or not, as long as there is steam enough to boil the dye. The principal trouble with "Nelson" is that he is trying to be his own

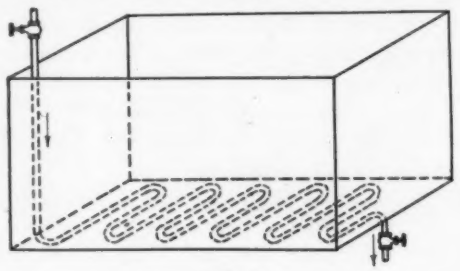


FIG. 1.

dyer and does not want to hire a man who has some knowledge of the business. He will have a hard time saving much by doing his own dyeing.

To begin with, his equipment for dyeing is not the best. If it is necessary to give the sheetings more than one run in the dyestuff the goods will be brought around to the front again. In all up-to-date plants the dyeing, starching and drying are continuous, something which I believe would be very easy to do in this case. The machine can easily be prevented from filling up by putting in a closed coil of pipe in the bottom of the dye box, as shown at Fig. 1. This closed coil will prevent the dye bath from filling up with condensed water from the steam pipes. The shade will be lighter as the day advances, unless the dye bath is fed with a dye liquor which is the same strength as the dye in the dye bath. If the goods are to be dyed with one run, the bath must be fed continuously.

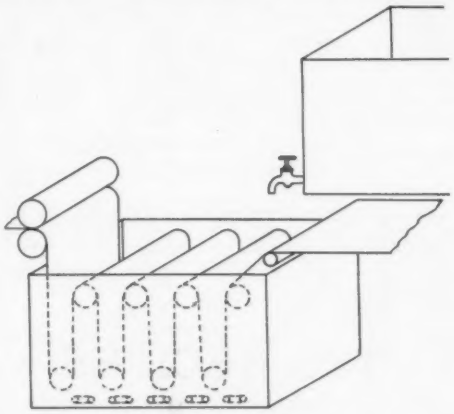


FIG. 2.

For example, suppose 400 pounds of sheeting is to be dyed in one continuous run. The dye bath will have to be made up to the required strength. This might take ten

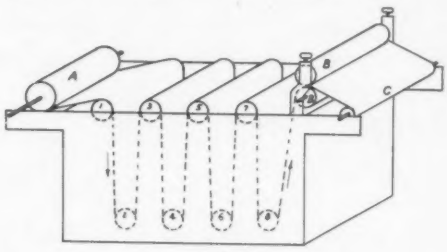


FIG. 3.

pounds direct black. Then make up a quantity of this liquor of the same strength in a separate storage tank. As the solution lowers in the dye vat it can be replenished from the storage tank by hand or by gravity. As the dye in the vat and in the feeding vat are of the same strength, the shade will be the same, if the dye bath is kept at the same height. The apparatus is illustrated at Fig. 2. A barrel will serve the purpose as well.

Some jiggers have an open steam pipe and some do not. Nearly all dye vats, kettles

and jiggers where standing dye liquors are kept, have closed coils. Where the dye is exhausted and the dye run off into sewers the steam pipes blow into the dye.

Baumwolle.

Color Cards.

Immedial Direct Blue; Cassella Color Co., New York.

Fourteen samples of cotton cloth, yarn and loose cotton dyed with Immedial Direct Blue 4 B and B B extra. These two products are distinguished for their special brightness of shade. Full working directions are given.

CORRECTION.

Argole Green B Paste, a product of Farbenfabriken of Elberfeld Co., under dyeing recipe No. 68 in our May issue, should have read Algole Green B Paste.

DYE RECIPES.

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD RECORD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16-page pamphlet, in convenient form for preservation. Subscription price for the Dyers' Supplement $1.00 per year.

Recipe No. 97.

Blue on Woolen Cloth.

Acid Cyanine G on 100 lbs. woolen cloth. Prepare the dye bath with

4 lbs. Acid Cyanine G.
(Berlin Aniline Works, 213 Water St., N. Y.)
4 lbs. Sulphuric Acid.
20 lbs. Glauber's Salt.

Enter at 150° F., bring slowly to a boil and dye at a boil for one hour.

Acid Cyanine G possesses good leveling and penetrating power. Its fastness to alkalies is excellent. Its fastness to light, weather, carbonizing and washing is good.

Recipe No. 98.

Yellow on Worsted Yarn.

Mercerol Yellow G on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Mercerol Yellow G.
(Read Holliday & Sons, 7 Platt St., N. Y.)
10 lbs. Glauber's Salt.
3 lbs. Acetic Acid.
2 lbs. Sulphuric Acid.

Enter at boiling point and boil for 5 minutes in order to dissolve the color and the salts. The cistern is run up with cold water and 3 to 5 lbs. acetic acid added. The bath is stirred and the material entered. Mercerol Yellow G is adapted to nearly all classes of woolen dyeing.

Recipe No. 99.

Blue Black on Cotton Yarn.

Diamine Black D B on 100 lbs. cotton yarn. Prepare the dye bath with

4½ lbs. Diamine Black D B.
(Cassella Color Co., 182 Front St., N. Y.)
30 lbs. Common Salt.

Enter at 180° F., dye at a boil for one hour. Then diazotize in a cold bath made up with

2½ lbs. Sodium Nitrite.
7½ lbs. Hydrochloric Acid, 32° Tw.

Then develop in a cold bath made up with

10 ozs. Meta Toluylene Diamine,

dissolved together with

5 ozs. Soda Ash.

Diamine Black D B when dyed and developed in this way gives an excellent shade of blue black possessing very good fastness.

Recipe No. 100.

Brown on Mercerized Cotton Yarn.

Sulphur Brown 6 G Extra on 100 lbs. mercerized cotton yarn. Prepare the dye bath with

8 lbs. Sulphur Brown 6 G Extra.
(Berlin Aniline Works, 213 Water St., N. Y.)
16 lbs. Sodium Sulphide.
5 lbs. Soda Ash.
80 lbs. Common Salt.

First boil up the bath with soda, add the dye previously dissolved by boiling up in water containing the quantity of sulphide of soda indicated above, and again bring to the boil for a short time. Then add the Glauber's salt and dye for 1 hour at about 200° F. After completion of the dyeing process rinse well until the rinsing water flows off colorless, then hydroextract and dry.

Sulphur Brown 6 G Extra possesses good fastness to washing, cross dyeing, light, alkalies and acids, and most of the other color destroying agencies.

Recipe No. 101.

Green on Worsted Yarn.

Monochrome Green A G on 100 lbs. worsted yarn. Prepare the dye bath with

2 lbs. Monochrome Green A G.

(H. A. Metz & Co., 122 Hudson St., N. Y.)
6 lbs. Ammonium Acetate.
1 lb. Potassium Bichromate.

Enter the material at 160° F., bring slowly to a boil and dye at a boil for 1 to 1 1/2 hours.

Monochrome Green A G is of a new group of dyestuffs which seems to offer many advantages. They are in reality after-chrome colors dyed in a single bath, with the use of ammonium chromate, the latter compound being produced in the dye bath by the action of ammonium acetate with potassium bichromate.

They dye level, are easily matched, and possess excellent fastness to light, fulling and other finishing processes. They are recommended for all sorts of fast dyeing, where the color is not too heavy.

Recipe No. 102.

Brown on Worsted Yarn.

Alphanol Brown B on 100 lbs. worsted yarn. Prepare the dye bath with

4 lbs. Alphanol Brown B.
(Cassella Color Co., 182 Front St., N. Y.)
10 lbs. Glauber's Salt.
3 lbs. Acetic Acid.

Enter at 140° F., raise to a boil in 1/2 hour, and after boiling for 1 hour exhaust the bath by the addition of

3 to 4 lbs. Acetic Acid.

Alphanol Brown B gives a bluish shade of brown, and will be found of value in the production of compound shades.

Recipe No. 103.

Red on Cotton Yarn.

Tetrazo Red D on 100 lbs. cotton yarn. Prepare the dye bath with

3 lbs. Tetrazo Red D.
(American Dyewood Co., 154 William St., N. Y.)
30 lbs. Common Salt.

Enter at 180° F. and dye at a boil for one hour.

Tetrazo Red D gives red shades of excellent fastness to light and good fastness to acids. In union dyeing it colors cotton and wool the same shade. By after-treatment with chromium fluoride its fastness may be increased.

Recipe No. 104.

Blue on Cotton Yarn.

Katigen Indigo 2 R L Extra on 100 lbs. cotton yarn. Prepare the dye bath with

10 lbs. Katigen Indigo 2 R L Extra.
(Farbenfabriken Co., 66 Lafayette St., N. Y.)
20 lbs. Sodium Sulphide (Crystals).
6 lbs. Soda Ash.
50 lbs. Glauber's Salt (Crystals).

Dye just below the boil for one hour, keeping the material below the surface of the liquor as much as possible.

In the second and succeeding baths, these amounts may be greatly reduced.

Katigen Indigo 2 R L Extra will be found to possess the characteristic properties of the sulphur blues.

Recipe No. 105.

Slate on Worsted Yarn.

Compound Shade on 100 lbs. worsted yarn. Prepare the dye bath with

15 ozs. Domingo Alizarine Blue R.
1 oz. Domingo Alizarine Yellow D.
(C. Bischoff & Co., 451 Washington St., N. Y.)
15 lbs. Glauber's Salt.
5 lbs. Acetic Acid.

Enter at 160° F. and dye at a boil for 3/4 of an hour. Then add

2 lbs. Sulphuric Acid

and continue the boiling for 15 minutes. Again add

1 lb. Potassium Bichromate

and boil 1/2 hour longer.

Domingo Alizarine Blue R combined with Domingo Alizarine Yellow D gives a slate which possesses excellent fastness to sunlight. These colors dye level and exhaust well.

Recipe No. 106.

Orange on Worsted Yarn.

Mercerol Orange 2 R on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Mercerol Orange 2 R.
(Read Holliday & Sons, 7 Platt St., N. Y.)
10 lbs. Glauber's Salt.
3 lbs. Acetic Acid.
2 lbs. Sulphuric Acid.

Bring the bath to a boil and dye for 1/2 hour.

Mercerol Orange 2 R is fast to light, milling, stoving, acids and alkalies.

Recipe No. 107.

Drab on Worsted Yarn.

Monochrome Drab G A on 100 lbs. worsted yarn. Prepare the dye bath with

1¼ lbs. Monochrome Drab G A.
(Kalle & Co., 530 Canal St., N. Y.)
½ lb. Potassium Bichromate.
6 lbs. Ammonium Acetate.

Enter material at 100° F., raise slowly to a boil during a period of 40 minutes and then boil for one hour.

Monochrome Drab G A is one of the new type of coloring matters, which although applied in a single bath in the presence of ammonium chromate give results characteristic of the colors afterchromed in a separate bath.

Recipe No. 108.

Yellow on Cotton Yarn.

Direct Yellow B on 100 lbs. cotton yarn. Prepare the dye bath with

1 lb. Direct Yellow B.
(E. M. Thayer & Co., 411 Atlantic Ave., Boston, Mass.)
20 lbs. Common Salt.

Enter at 180° F., dye at a boil for one hour.

Direct Yellow B is fast to light, chlorine, acids and alkali, goes on wool only slightly, and is especially fast to washing. It is a very level dyeing color and is particularly useful for combinations.

Recipe No. 109.

Yellow on Cotton Yarn.

Thioxine Yellow G on 100 lbs. cotton yarn. Prepare the dye bath with

6 lbs. Thioxine Yellow G.
(Geisenheimer & Co., 189 Front St., N. Y.)
6 lbs. Sodium Sulphide (conc.).
6 lbs. Soda Ash.
60 lbs. Glauber's Salt (Crystals).

Dissolve the color as usual with sodium sulphide. Add to the dye bath, boil up and skim. Then add the Glauber's salt or common salt.

Enter the boiled out yarn into the dye bath and dye just under the boil for one hour, after which the yarn is quickly squeezed and rinsed.

Thioxine Yellow G will be found to possess the characteristic fastness of the sulphur colors.

Note:—For a running bath 4 lbs. of color may be used.

Recipe No. 110.

Blue on Cotton Yarn.

Thioxine Dark Blue B on 100 lbs. cotton yarn. Prepare the dye bath with

10 lbs. Thioxine Dark Blue B.
(Geisenheimer & Co., 189 Front St., N. Y.)
20 lbs. Sodium Sulphide (Conc.).
8 lbs. Soda Ash.
35 lbs. Sodium Sulphate (Calcined).

Dissolve the color as usual with sodium sulphide. Add to the dye bath, boil up and skim. Then add the Glauber's Salt or common salt.

Enter the boiled out material and dye at a temperature of 170° F. for one hour. Then squeeze the material thoroughly and hang in the air for a short time for the color to develop.

Thioxine Dark Blue B will be found to possess the characteristic fastness of the sulphur colors.

Note:—For a running bath 6 lbs. of color may be used.

Recipe No. 111.

Grey on Cotton and Wool Union Material.

Union Grey 9751 on 100 lbs. cotton and wool union material. Prepare the dye bath with

1.6 ozs. Union Grey 9751.
(W. F. Sykes & Co., 85 Water St., N. Y.)
10 lbs. Common Salt.

Enter the material at a temperature of 140° F., raise slowly to 170° F., maintain this temperature for 1/2 hour, or until the cotton is up to the desired shade, then bring to a boil and boil for 1/2 hour, or until the wool is up to shade.

Union Grey 9751 dyes both cotton and wool about the same shade and will be found valuable for a shading color in the dyeing of all grades of cotton and wool union material.

Recipe No. 112.

Brown on Cotton Yarn.

Sandusky Brown 3 R on 100 lbs. cotton yarn. Prepare the dye bath with

5 lbs. Sandusky Brown 3 R.
(F. E. Atteaux & Co., 176 Purchase St., N. Y.)
40 lbs. Common Salt.

Enter at 180° F. and dye at a boil for one hour.

Sandusky Brown 3 R is dyed with the addition of a large amount of common salt, and when after-treated in a fresh bath with

2 lbs. Formaldehyde

or with a mixture of

2 lbs. Potassium Bichromate

and

2 lbs. Formaldehyde

in boiling bath, good dyeings are produced which will stand any amount of fulling. It is valuable, therefore, in dyeing cotton yarn which is to be used in combination with worsted yarn in the manufacture of piece goods.

Oldham, England, is the greatest cotton spinning place in the world. It has nearly 200 mills, containing 15,000,000 spindles and giving employment to 37,500 persons whose annual wages amount to $12,166,250.

Mill News.

Those interested in receiving early and more complete investigated information of projected new mills, enlargements, improvements, fires facts and gossip of the trade are referred to the Textile Advance News, issued weekly by the publishers of the Textile World Record, at $15.00 per year.

COTTON.

New Mills.

*Alabama, Childersburg. It is reported that the Coosa River Spinning Co. has awarded contract for 10,000 spindles to be installed in its new plant. Details of the progress of this company, from its organization, have been given from time to time.

Florida, Jacksonville. The Wilson-Toomer Mfg. Co. has decided to erect a mill, 84 by 90 ft. and two stories high, to be equipped with spinning and weaving machinery for making cotton bags. Machinery contracts have not been given out.

*Georgia, Blakeley. Organization has not been completed by C. M. Deal and associates, who were reported to be promoting a new cotton mill company. They are still working on plans, however, and expect to organize before fall.

*Georgia, Calhoun. Information on complete equipment of machinery and supplies for the manufacture of print cloth, including dynamos and electric light apparatus, is desired by the new Echota Cotton Mill. We have reported the progress made by this company which was incorporated in July, 1907, with capital stock of $100,000. Building is being erected at present to hold 10,000 spindles and 240 looms. T. W. Harbin of Calhoun is president and buyer.

*Massachusetts, Wilkinsonville. The John H. Meyer Co., will not make any statement in regard to the new cotton mill at this place, but it is perhaps true they are backing the enterprise. The John H. Meyer Co. also controls the Springdale Finishing Co. at Canton, Mass., and makes a specialty of military khaki, army and navy duck and uniform cloths.

*North Carolina, Belmont. Work is going forward on the plant for the new Majestic Mfg. Co. and the officials state that they hope to begin manufacturing in the fall. In addition to the mill buildings, a number of cottages are being erected for operatives. A. C. Lineberger of Mt. Holly, N. C., is president of the Majestic Company and S. P. Stowe of Belmont is secretary-treasurer.

*North Carolina, Brevard. Total equipment of the Transylvania Cotton Mills will be 4,000 spindles and preparatory machinery for the production of 40s 2-ply cotton yarns. Earlier reports gave the equipment as 5,000 spindles. The building has been completed and it is expected that all machinery will be set up ready to begin manufacturing by October. Saco & Pettee Machine Works of Newton Upper Falls, Mass., are supplying machinery.

*North Carolina, Charlotte. Further plans of the new Jewel Cotton Mills have been given out. A mill with capacity for 12,000 spindles will be built but only 6,000 will be installed at first. Plans have not yet been completed. T. J. Lillard is secretary-treasurer, and is in charge.

*North Carolina, Denton. The location selected for the new Denton Cotton Mills Co. being 20 miles from a large railroad, and the small road running through the town being in the hands of a receiver, there will be no definite work on the construction of the plant until railroad transportation facilities are more definitely assured.

*North Carolina, Kinston. About July 15 the buildings for the new Caswell Cotton Mills, Inc., will be completed. Cost of the main building is approximately $20,000 and it will be equipped with 5,400 spindles and accompanying machinery for manufacturing 20s to 24s hosiery yarns. Contracts have all been placed. J. E. Hood is pres. and F. C. Dunn is treas. Other details of this company have been given in these columns.

North Carolina, Lincolnton. Manufacturing will begin in a few days in the plant of the Eureka Mfg. Co. This company was formed in June, 1907, and incorporated with capital stock of $40,000. Building operations began in June, 1907, and since that time, buildings have been completed and 1,020 mule spindles installed for manufacturing 2s to 10s single and ply yarns. J. L. Lineberger is president and L. J. Dellinger is treasurer and buyer. Electric power is used.

*North Carolina, Newton. In November, it was reported that the Ridgeview Cotton Mills had awarded contract for its mill buildings. This work has been completed and the company is now planning to install the initial equipment of machinery, which will consist of 2,500 spindles, with preparatory machinery. The motive power will be electricity. L. A. Phillips is president, and H. F. Smith is general manager. The Ridgeview Cotton Mills were incorporated in October with capital stock of $100,000.

*North Carolina, St. Pauls. The construction of buildings for the St. Pauls Cotton Mill Co., which was delayed by the recent depression, will be pushed forward as rapidly as possible. This company was incorporated in July, 1907, with capital stock of $100,000. Five thousand spindles will be the equipment and medium yarns will be made. A. R. McEachern is secretary-treasurer and in charge of building operations. R. C. Bibberstein of Charlotte, N. C., is architect-engineer in charge.

*North Carolina, Weldon. By August 1 the Shaw Cotton Mills, Inc., will have completed its main building and installed 5,129 ring spindles for manufacturing 20s to 30s single warps. Machinery will cost about $50,000 and has been ordered from the Mason Machine Works of Taunton, Mass. The power plant will consist of 200 h. p. Corliss engine and two 100 h. p. boilers. J. E. Sirrine of

Greenville, S. C., is the architect-engineer in charge and W. T. Shaw of Weldon is president.

*Rhode Island, Alton. Manufacturing has been started in the old Alton Mfg. Co.'s plant by the new Richmond Lace Works. Equipment consists of three lace machines, which are being run 9 hours a day on trimming laces. The plant is run by steam and water power and has a complete dyeing department. Later on the officials expect to run two shifts of hands, keeping the plant in operation 20 hours.

*South Carolina, Calhoun Falls. It can be definitely stated that the Calhoun Mills will start manufacturing about September. Equipment is 16,384 spindles and 400 looms. Wide print cloth for converting will be manufactured and product sold through Harding, Whitman & Co. James P. Gossett is president, treasurer and buyer and M. Y. Harrison is superintendent. All machinery and supplies have been bought.

*South Carolina, Charleston. The date on which building operations will commence on the plant for the Carolina Waste Mills, reported incorporated in November with capital stock of $200,000, is still undecided. No equipment has been arranged for and it is understood that plans for the buildings have not been completed. Wiping waste, mattress felts, carpet and stair pads, paper stock, bagging ties, etc., will be manufactured. Information concerning this company can be had by addressing George Lunz, secretary and treasurer of the Royal Bag & Yarn Mfg. Co., Charleston, S. C.

*South Carolina, Newberry. It is reported that the Highland Cotton Mills, a new company incorporated in November with capital stock of $300,000, is making plans for the erection of its mill. F. S. Martin and Geo. S. Mower are at the head of this company.

*South Carolina, St. Matthews. Complete information regarding the proposed company for developing power on High Hill Creek and building a 20,000-spindle cotton mill is as follows: D. J. Ziegler of Atlanta, Ga., is making an estimate of the cost of constructing a dam. As soon as this is done, D. D. Buyck will take up the matter of organizing a company and if successful in this, will advertise the property for sale. Mr. Buyck advises that at present he does not think there is a chance of forming a company composed solely of local parties, and will be interested in any proposition for the utilization of this property by parties commanding capital.

*South Carolina, Simpsonville. About September 1 the new Simpsonville Cotton Mills will begin manufacturing. The building will be completed shortly and already preparations are being made to set machinery in place. Initial equipment will be 8,000 spindles and 200 Draper looms and product will be 38-inch 64 by 64 goods from 28s to 38s yarns. Haines & Bishop will dispose of the output. E. F. Woodside is president, treasurer, agent and buyer. A superintendent to take charge of the factory has not been engaged.

*South Carolina, Yorkville. All machinery for the new Lockmore Cotton Mills has been received and is being set up. Progress in this company has been reported from time to time.

Enlargements and Improvements.

*Alabama, Alexander City. The spinning mill addition to the Russell Mfg. Co., which was recently built, is fully equipped and ready to start manufacturing.

*Alabama, Florence. The Ashcraft Cotton Mills have not definitely decided to make changes in their power plant. They are considering the matter of making changes and will be glad to give full information of the results desired, on application.

Connecticut, Baltic. It is reported that the Baltic Mills Company has awarded contract for the erection of a reservoir.

Connecticut, Willimantic. Within a few months the Windham Mfg. Co. will install an electric power plant for running some departments of their mills. Contracts have been let which it is understood call for a 1,000 horse-power engine, two 500 horse-power boilers, electric generator and complete wiring. The mills are already lighted by electricity.

*Maine, Brunswick. Work will commence during July on the new building for the Cabot Mfg. Co. This addition is to replace an old structure, making the plant more up-to-date. The dimensions are 100 by 120 ft. and 5 stories high. For the present no increase in machinery is contemplated.

*Massachusetts, Fall River. In addition to setting up a new Harriss-Corliss cross compound engine, of 1600 horse-power, the Troy Cotton & Woolen Manufactory will add three new Howard & Bullough slashers during the shut down. Manufacturing will be resumed in full as soon as the engine is in running condition. This company has capital stock of $300,000 and operates 14,400 mule spindles, 33,120 ring spindles and 1,059 looms. John F. Brayton is president, Herbert H. Horton is treasurer, agent and buyer and Wm. E. Sharples is superintendent.

Massachusetts, Fall River. The enlargement at the Richard Borden Mfg. Co.'s plant is a small addition to be erected to No. 2 mill in order to make a better balance of machinery.

*Massachusetts, Fall River. At a special meeting of the stockholders of the Davis Mills, it was voted unanimously to increase the capital stock from $500,000 to $1,250,000. Present stockholders are to be allowed to subscribe at par for one share of new stock for each share now held by them. Payments are to be extended to June 1, 1908, when a stock dividend of 25 per cent. will be declared to the stockholders of that date. The increase is to finance the building and equipment of a new mill, which will have a capacity of 65,000 spindles. Plans prepared for the building call for a structure 435 by 157 ft. and 3 stories high.

*Massachusetts, Holyoke. It is reported that the Lyman Mills have awarded contract for the proposed new mill to Caspar Ranger. Plans were prepared for this building some months ago, but it was recently announced that the building would

be delayed until fall and one story be added to No. 3 mill to provide the space needed at present. It is thought that the company has found it desirable to go ahead on the construction of the new mill. The new building will be 300 by 100 ft. and 5 stories high. The foundation, which is of concrete, was put in some months ago. It is estimated that the cost of the improvement will be about $150,000.

Massachusetts, Lawrence. The Pacific Mills have placed an order for a number of new cards with the Saco & Pettee Machine Works. The new machinery is to take the place of old cards to be thrown out and will be set up and put in operation as soon as received. Reports that the Pacific Mills will erect a new dye house are incorrect.

Massachusetts, Lowell. The Merrimack Mfg. Co. has made application for a permit to build an overhead bridge to connect its print works with its plush mill. The bridge will be 120 ft. long and 38 ft. from the ground, and estimated cost will be $600.

*Massachusetts, New Bedford. Lumber has arrived for the new weave shed to be erected for the Potomska Mills and construction work will be pushed forward.

New Jersey, May's Landing. The May's Landing Water Power Co. will purchase 457 new Northrop looms of the Draper Company, which will take the place of a similar number of old looms to be thrown out.

New Jersey, Millville. The Millville Mfg. Co. is replacing 644 old style looms with the same number of new Draper looms, making the total number of looms in the mill 1,057. All the new machinery will be set up and put in operation as fast as possible. J. F. Reardon is superintendent of this plant.

*New York, Le Roy. Foundations for the new building, which it was reported in February would be built for the Le Roy Cotton Mills, are being put in. The new mill will measure 48 by 150 ft., and when completed will be used as a yarn mill. Among other equipment a number of combing machines will be installed. Recently the capital stock of the Le Roy Cotton Mills was increased from $450,000 to $750,000 to provide for an enlargement of the business in all departments.

*North Carolina, Cooleemee. Plans have been completed for and construction work begun on the new picker building for the Cooleemee Cotton Mills of the Erwin Mfg. Co. to replace the building which was burned several weeks ago. All contracts have been given out.

North Carolina, Hope Mills. The Hope Mills Mfg. Co. will install shortly an Allis-Chalmers 250 kilowatt belted alternator with excitor and switch board and about 300 h. p. in Allis-Chalmers induction motors. J. Fred Houston of Philadelphia is interested in this company.

*North Carolina, Roanoke Rapids. The new addition to the plant of the Rosemary Mfg. Co., on which work began in December, has been completed, but the machinery has not been set up. The equipment, consisting of 5,000 spindles and 104 looms, has arrived at the mill, but the demand for the goods to be made is at present not strong enough to warrant starting up the machinery.

North Carolina, Rockingham. A new slasher department is being erected for the Great Falls Mfg. Co. It is reported the estimated cost is about $15,000 and will be completed in September.

*Pennsylvania, Philadelphia. McConville & Hasley, proprietors of the Reno Mfg. Co., which was burned out in a fire which destroyed the tenement mill at Josephine and Oxford Sts., advise that they will locate in another building as early as possible. At the present time quarters have not been secured. They manufacture ladies' dress goods and imitation hair goods from cotton yarns. The original equipment was 40 looms.

Pennsylvania, Philadelphia. The Delta Spinning Co., Frankford, who report that they are running their mills both day and night on combed Egyptian, Peeler cotton yarns, operating 6,000 ring, 13,000 mule and 4,000 twisting spindles, within the past few months have been compelled to increase their equipment by an addition of new cards, spinning frames, etc. They have also put in 50 spindle cone winders of the Universal make. The plant, which is under the management of W. R. Garsed, sells direct.

Pennsylvania, Philadelphia. It is reported that Messrs. Royle & Campbell, manufacturers of damasks and upholstery goods in the Dale Mill at 1729 Gillingham St. on 7 broad looms, which they sell direct, are looking for other quarters into which they will remove and double their equipment.

*Rhode Island, Albion. The work of tearing down the old building of the Valley Falls Co. to make room for a new structure has been completed and construction work on the new building will be started at once. Fifteen hundred new spin-

*Rhode Island, Central Falls. Construction work is completed on the new addition erected for the Waypoyset Mfg. Co. The new structure is 112 by 52 ft., connected to the main plant on one end, the other end being boarded up, apparently with a view to extend the length of the building at some future time.

*Rhode Island, Georgiaville. Improvements to the Bernon Mills, which we reported in May, are in the form of a new mill to replace the old mill, which will be torn down. Prints, sateens and twills are manufactured on 619 looms.

*Rhode Island, Woonsocket. Improvements in the card rooms of the Manville Company consist of replacing 140 old cards with the same number of new ones.

*South Carolina, Lando. Little new machinery will be bought for the new addition recently completed for the Manetta Mills. The addition was designed principally to provide more space for machinery already installed.

*South Carolina, Newberry. As yet nothing has been done toward the erection of the reported branch plant of the Newberry Cotton Mills and company advises that it does not know at present just what the plans will be.

South Carolina, Union. The Union-Buffalo Mills

are carrying out plans for improvements which will bring the plants to a thoroughly up-to-date condition. Two thousand old looms will be taken out and the same number of new automatic looms put in their place. Contract for new machinery has been awarded to the Draper Company.

Virginia, South Boston. At a meeting of the stockholders of the Century Cotton Mills, the capital stock was increased from $60,000 to $150,000. F. A. Lukin, for a number of years connected with the Paramount Knitting Co., Chicago, was elected president and treasurer. A number of improvements will be made to the plant, giving better facilities for manufacturing and largely increasing the output. Until October 1, Mr. Lukin's address will be Kankakee, Ill. The Century Cotton Mills manufacture 10s to 24s hosiery yarns on an equipment at present of 8,064 spindles.

Mills Starting Up.

Indiana, Evansville. The Evansville Cotton Mfg. Co. has started on a 4 days a week schedule after a shut down of several weeks.

*North Carolina, Charlotte. The Charlotte Cotton Mills have started up for the purpose of running out the stock on hand. This will require two or three months. At the completion of this work, the mill property will be sold, following out the plan of liquidating the business which has been reported.

WOOLEN.

New Mills.

Maine, West Buxton. John W. Crowther, superintendent of the Wakefield Mfg. Co., Wakefield, R. I., will resign his position with that firm on July 1 and install 10 looms in the old W. & R. Brier woolen mills. Worsteds will be manufactured.

*Massachusetts, Monson. Plans are being drawn by E. C. & G. C. Gardner of Springfield for a new woolen mill to be built for A. D. Ellis. The new structure will be of brick, stone and terra cotta, four stories high, 66 by 160 ft., with an ell 40 by 100 ft. This new mill will be equipped with six sets of cards and 36 looms for manufacturing kerseys and broadcloths. Both water and steam power will be used.

Pennsylvania, Philadelphia. The Anchor Combing Works, of which Pearce & England are the proprietors, have leased the building formerly occupied by the Angola Dye Works at Hancock and Huntingdon Sts., which they are getting in readiness to equip with machinery for the assorting, scouring and combing of wool. The plant will contain, when it is started up in about three or four weeks, 2 combs, 3 cards, 1 picker and 1 willow. It is the intention of the owners to increase the equipment to 10 cards and 6 combs as soon as the machinery can be delivered. J. W. England, who will manage the plant, was formerly employed by the Roosevelt Worsted Mills, and Robert Pearce comes from S. B. & B. W. Fleisher.

*Rhode Island, Bristol. The reorganization of the Namquit Worsted Mills will be known as the Namquit Worsted Co. Charter has been secured with capital stock of $100,000. As previously reported, M. T. Rubenstein and J. L. Rubenstein of L. Rubenstein & Co., 349 Broadway, New York, are the new owners. J. Harvey Merrill, who has been manager of the mill since it begun to manufacture worsted cloth, will be a stockholder in the new company and will remain in charge of manufacturing. A new dye house is being built.

*Rhode Island, Providence. A number of wool sorters will start work at the new Providence Combing Co. next Monday, June 29. As soon as enough wool is sorted and can be run through the departments, the plant will start up in full. This will probably be early in July. As previously reported, Hills & Nichols, wool dealers of Boston, are in control of the plant.

*Tennessee, Lebanon. Some of the details of the proposed new woolen mill are as follows: A site has been acquired and a large part of the stock subscribed so that at an early date it is expected to incorporate a company with a capital stock of $75,000. Dr. H. K. Edgerton is in charge of the arrangements.

Enlargements and Improvements.

*Connecticut, Stafford. The addition being erected for the Phoenix Woolen Co. will be 54 by 82 ft., of brick, and one story high. Tracey Bros. of Waterbury, Conn., are the contractors. 5 sets of Davis & Furber cards will be machinery equipment.

*Connecticut, Stafford. Recent improvements at the old Riverside Woolen Mills, now owned by Wm. Park, include the installation of one 320-spindle Johnson & Bassett mule, four Barker condensers, one Davis & Furber mixing picker with Harwood feed, and seven Bates & Robinson improved feeds. All wool men's suitings and dress goods are manufactured. No further improvements are under consideration at the present time.

Illinois, Hanover. The Hanover Woolen Mfg. Co. has shut down its plant for the summer. During the suspension, extensive repairs are to be made to the plant. The Hanover Woolen Mfg. Co. manufactures cassimeres and meltons on 8 sets and 32 looms.

*Massachusetts, Clinton. Further details of the new power house for the Bigelow Carpet Co., plans for which have recently been completed by Chas. T. Main, mill engineer and architect of Boston, are as follows: Brick buildings will be erected comprising a power house 102 by 63 ft., a boiler house, 197 by 50 ft., a coal pocket 197 by 70 ft. and a pump house, 48 by 27 ft. The roofs are to be of plank, tar and gravel, except that over the power house, which is to be of concrete and plastic slate. Coal is to be conveyed from the Boston & Maine R. R. tracks by double track underground tunnel, passing under Main St., the latter to be raised to permit of this arrangement. Midway between the coal pocket and boiler house will be a brick boiler stack 200 ft. high, with a 10 ft. flue. The equipment will consist of 2 electric units, one of about 750 K. W. and the other of about 350 K. W. Six new 84 in. by 19 ft. boilers are to be added to the

eight old boilers of the same size. Two fire pumps and four feed pumps complete the power outfit. Pipe tunnels will connect the power house with the dye house and power house with the weave mill, the former for steam piping and the latter for electric power cables. Contract for construction work has been awarded to the J. W. Bishop Co.

Massachusetts, Lawrence. An enlargement is being made in Section D of the Wood Worsted Mills in order to give more space for the rearrangement of machinery in that section.

Massachusetts, Lowell. The Merrimack Woolen Co., Dracut, has just connected a new high pressure water pump to be used in case of fire.

*Massachusetts, Lowell. The Massachusetts Mohair Plush Co. has closed, to facilitate the installation of the new power plant recently reported as being added. It is expected that two weeks will be necessary for the installation of the power plant.

Massachusetts, Methuen. A new sprinkler system is being installed throughout the plant of the Tremont Worsted Co. This plant is running in full on orders.

*Massachusetts, Pittsfield. The new looms being set up in the Silver Lake Mills of W. E. Tillotson are to take the place of old looms which are being thrown out. The total number of looms will remain the same.

Massachusetts, Rochdale. E. C. Carlton & Sons have shut down their plant while a new stone flume is being erected.

*New Hampshire, Bristol. The additional space being provided by the new addition to the Dodge-Davis Mfg. Co.'s plant will be used for an enlargement to the wool scouring department. Construction work is going forward.

*New Jersey, Passaic. Contract for construction work on the new building for the Botany Worsted Mills has been awarded to the John W. Fergeson Co. of Paterson. Plans for the new building call for a 4-story brick structure 130 by 144 ft., to cost approximately $90,000.

Pennsylvania, Chester. A 200 horse-power Wetherill-Corliss engine is being installed in the Emmott Worsted Spinning Co.'s plant, taking the place of the old engine, which has been in operation for some years. It is reported four additional spinning frames will soon be installed. 2/16s to 2/40s worsted weaving and knitting yarns are manufactured on the Bradford system.

Pennsylvania, Philadelphia. The Penn Worsted Company, manufacturers of worsted goods, worsted and cotton twists, with 60 broad looms and 3,000 worsted spindles at Hancock and Turner Sts., have recently leased the two-story building formerly occupied by the Melbourne Knitting Mills at 167 West Oxford St., which they are fitting up for office purposes and will also use as a silk resist department to be used in conjunction with the main plant at the former address.

Pennsylvania, Philadelphia. The Roosevelt Worsted Mills, 2023 Naudain St., are putting in new machinery which will enable them to increase the capacity of their plant. The mill now runs 4 cards, 3 combs and 3,500 spindles on worsted yarns.

Pennsylvania, Philadelphia. It is reported that A. J. Cameron & Co. have taken over the plant containing 3,000 spindles formerly operated by Jos. T. Smith, who recenly died, located at Emerald and Westmoreland Sts., where he manufactured worsted yarns on the Bradford system on commission. It is stated that they will run it in conjunction with their main mill at Glenwood Ave. and Pacific St.

*Pennsylvania, Philadelphia. When the demand for their line of worsted skirtings and suitings returns to normal, the Wm. Kimmerling Mfg. Co. will build and equip the finishing plant which we recently reported was proposed by them. Thirty-two 72-in. Knowles 4 by 4 box looms are being added to the weaving department. This company has capital stock of $50,000. Wm. Kimmerling is president and R. H. Pittman is treasurer.

*Rhode Island, Woonsocket. The addition to the Lowland Worsted Co. will be used for spinning worsted yarns on the Bradford system. At present only French spun yarns are manufactured. Construction work is going forward.

Rhode Island, Woonsocket. Construction work is progressing on a small addition to the dye house of the Dunn Worsted Mills. Additional space is being provided for two more dye tubs.

Mills Starting Up.

*Connecticut, Glenville. The local plant of the American Felt Co. started up on the same line of goods that have been manufactured for the last 10 years, on June 15. A fair amount of orders are on hand and the company reported that they expect to keep the mill running on full time. During the shut down, which lasted six weeks, quite extensive repair work was completed.

Connecticut, Quinebaug. After a shut down lasting several weeks, it has been announced that the local plant of the Intervale Mills Corp. will resume in full as fast as help can be employed. Woolen goods are manufactured.

Maine, Dexter. The Abbott & Latimer Co.'s mill at North Dexter has been started up on yarns for the Amos Abbott Co.

*Massachusetts, Farnumsville. Some departments of the Excelsior Mills have been started up and all the machinery will start as soon as operatives apply for work. An assignee was appointed in April.

*Massachusetts, Uxbridge. At a meeting of the stockholders and creditors of the C. A. Root Company, an agreement was reached which will result in the company's taking control of the plant and starting up about July 15. It will be remembered that this company was reported financially embarrassed in April, and since that time various propositions have been made to creditors.

Minnesota, Fosston. After remaining idle since the first of November, the Fosston Woolen Mill has been started up by F. A. Patrick & Co. of

Duluth, who have leased the property. Flannels, blankets and woolen yarns are manufactured.

Ohio, Ashtabula. No. 2 Mill of the Ashtabula Worsted Mills, which has been shut down since January, is re-opened. During the shut down, the equipment was thoroughly repaired and put in first class shape.

Pennsylvania, Philadelphia. The Cheefoo Mills, operated by Taylor Bros., 2739 N. Fairhill St., on dress goods and men's wear with 30 broad looms, which has been shut down for several weeks, has been started up again on full time.

Mills Shutting Down.

Maine, North Berwick. The North Berwick Co. has shut down. No statement is made as to when the mills will be reopened, but it is probable the suspension will not last over four weeks. Dress goods and French flannels are manufactured on 8 sets and 42 looms.

Maine, South Berwick. The Newichawanick Company has shut down for two months, and possibly for a longer period, owing to slow business in their line of blankets.

Maine, Sangerville. The Campbell Mfg. Co. has shut down its plant. 4 sets and 60 broad looms were operated on ladies' broadcloth.

Massachusetts, Ware. Notices have been posted in the woolen mill of Charles A. Stevens & Co. to the effect that the mill will shut down July 1 for a period of two months.

Massachusetts, Westboro. The Westboro Mills have shut down for an indefinite time. The mills have been running half time for the past four months. Carpets, tapestries and velvets are manufactured on 26 looms, product being sold direct at the New York office.

New Jersey, Somerville. The Laurel Mfg. Co. has shut down the plant preparatory to going out of business. The plant is for sale or lease. Men's wear and worsted dress goods were manufactured on 54 looms of 82 in. reed space. All yarns were bought. The company has capital stock of $100,000. Charles Wink is pres., agent and buyer; H. L. Wissing, treas., and Fred Wink, supt.

Pennsylvania, Philadelphia. The West End Woolen Mills Co., which was incorporated about one year ago, and which leased the plant formerly operated by H. S. Henry, at 64th and South Sts., have discontinued operations and shut down the plant. It is not known whether other parties will again start it up or not. The mills contain 7 sets, 180 looms, which were formerly run on flannels and cassimeres, with a dye and finishing plant.

Pennsylvania, Philadelphia. The Lehigh Worsted Co., which incorporated two years ago with a capital of $10,000 with J. K. Lamb, president, H. F. Lamb, secretary and treasurer, and James Stocks, manager, for the manufacture of high grade dress goods and men's wear with 25 broad looms, have shut down the plant and have put it up for sale. The mill is located at Kensington Ave. and Huntingdon St., in the Empire Mills.

SILK.

New Mills.

*Connecticut, Mystic. A number of dwelling houses and a mill building are being built at Industrial Place. On the completion of the factory a company known as the Ninigret Mills Co., which will manufacture silk linings and similar goods, will equip it with machinery to include 100 looms. Otto O'Sullivan of Stonington, G. W. Mansfield and A. T. Ledwidge of Waterbury are interested in the Ninigret Co.

Delaware, Wilmington. The Wilmington Silk Co. has purchased a building on West 4th St. and will shortly begin alterations preparatory to manufacturing. Silk ribbons will be the product and it is expected to eventually give employment to about 100 hands.

*Pennsylvania, East Greenville. A. Schultz is superintendent of the Imperial Ribbon Co., a new concern started here recently for the manufacture of silk ribbons.

Pennsylvania, Pen Argyl. The Pen Argyl Silk Co., capital stock $50,000, has equipped a plant of 10,000 spindles for throwing organzine silk. John M. Stewart is president and Charles J. Knowles is treasurer, agent and buyer.

Enlargements and Improvements.

*Massachusetts, Hopkinton. By August 1, alterations will be completed in the Hermina Silk Mill and manufacturing will be resumed in full. It is understood that no new machinery will be needed, the changes merely being in the rearrangement of the present equipment.

*New Jersey, Paterson. The Passaic Silk Co., Inc., which we reported would take over the business of B. Bornstein and E. Trachsler, a co-partnership, will make extensive improvements after September 1. It is planned to increase the present equipment of 62 looms to 100 looms. B. Bornstein has been elected president, A. B. Hopper is treasurer and Walter B. Hudson is secretary. Mr. Bornstein is also buyer. The plant is driven by electricity and gives employment to 50 hands. Broad silks are the product.

MISCELLANEOUS.

*Connecticut, Meriden. Harry Adlman, formerly of the Textile Braid Co., has formed the H. Adlman Co. and will start a plant in this city of 35 braiders for manufacturing a line of braids for the dress, cloak and millinery trades. The capital stock is $5,000, and H. Adlman is president, treasurer and buyer. It is expected that manufacturing will begin about June 20. 2/15s mercerized and 1/40s glazed yarns will be bought.

Connecticut, Stonington. Contract has been awarded by the Atwood-Morrison Co., manufacturers of silk machinery, for an addition to their plant. The new structure will be 2 stories high, 30 by 42 ft., and will be completed as soon as possible.

*Delaware, Wilmington. The report that the Brandywine Bleachery was in operation is incorrect. James F. Wimmington, who is in charge of the project, advises that it will be some little time before the plant is equipped ready for running.

Massachusetts, Attleboro. The Royal Textile Co., manufacturers of shoe laces, has set up a number of new braiding machines.

*Massachusetts, Fitchburg. Plans made by the Houghton Web Co. for the enlargement of their plant comprise the installation of 28 looms. It has not been definitely decided when building operations will commence. Elastic webbing is the product of this company.

Massachusetts, Peabody. A 2-story brick addition, 187 by 80 ft., is being erected for the Danvers Bleachery & Dye Works. Grant Walker, 89 State St., Boston, is manager and buyer. They bleach and dye cotton piece goods to 100 inches. The present capacity is 7 tons per day. Machinery contracts have not been awarded.

*Massachusetts, North Dighton. The Chadwick Print Works has started running. It is understood that sufficient orders have been received to keep the plant in operation full time.

*New Jersey, Bayonne. "Leolastic," a company with capital stock of $100,000, previously reported as having purchased a site at Newark, have started the construction of buildings in the city of Bayonne, which is contiguous to New York City. 100 looms will comprise the equipment. Geo. C. Moore is president and Albert Herbert is treasurer. They are interested in all kinds of building materials, equipment and supplies.

*New Jersey, Camden. The incorporators of the Marshall-Robertson Co., reported incorporated last week with capital stock of $10,000, are N. A. Henry, K. V. Muyler and M. E. Kerr, all of Pittsburg, Pa. It is understood that a dyeing and bleaching plant will be operated in Pittsburg. Information can be obtained by addressing the N. J. Corporation Guarantee & Trust Co., 932 Frick Bldg., Pittsburg, Pa.

*New Jersey, Paterson. The branch of the Weidmann Silk Dyeing Co. which was destroyed by fire was located one mile from the main works, which were not incapacitated in any way. The branch mill was used for the manufacture of charcoal and black iron liquor. It will be rebuilt at once.

*New York, Troy. The Wynantskill Mfg. Co., reported incorporated last week with capital stock of $50,000, will mercerize yarns and make knit specialties. Edward F. Murray is president, Wm. D. Mahoney, treasurer of the Faith Knitting Co. of Averill Park, N. Y., is treasurer, and John Nolan is secretary.

Pennsylvania, Philadelphia. Construction work is progressing on the new dye house being built for Brehm & Stehle. The new building will be 3 stories high, 50 by 72 ft., instead of the dimensions given previously. Mr. Stehle is buyer.

Pennsylvania, Philadelphia. T. J. Clements, who has been manufacturing cotton waste for machinery and packing purposes at 2803-5-7 N. Fairhill St., has in contemplation the erection of a new mill in the neighborhood of Fox Chase, into which he will remove when completed. The new building, which will be fireproof throughout, he expects to have built during the summer.

Pennsylvania, Scranton. It is reported that the Wyoming Yarn Co., a concern operating a plant at Wilkesbarre, and which recently was incorporated in Delaware with capital stock of $75,000, has secured a site at this place on which a modern mill will be erected during the summer. George H. Craven is president of the Wilkesbarre Yarn Co., Jacob Schiffer is vice-president, Geo. W. Craven, secretary, and P. F. May, treasurer. They may be addressed at Wilkesbarre.

Rhode Island, Pawtucket. The new corporation known as Glencairn Mfg. Co., will equip a plant for manufacturing silk shoe laces at 110 East Ave. The company has capital stock of $100,000. John Turner, formerly superintendent of the Zephyr Textile Co., is in charge.

*Rhode Island, Providence. Machinery is being installed in their building on Willard Ave. by the Rhea Yarn Co. Special yarns will be manufactured from ramie for braid, plush, knitting, weaving and embroidery. W. S. Hodgson is agent. The office is at 28 No. Main St., Providence.

FAILURES AND SUSPENSIONS.

Illinois, Ipava. Creditors have filed a petition that Charles F. Foote, proprietor of the Ipava Woolen Mills, be adjudged bankrupt. The chief creditor is J. W. Quillin of the Bank of Ipava, who is reported to have a claim of $60,000. Blankets and homespuns were manufactured on 2 sets and 9 looms.

Massachusetts, Monson. A voluntary assignment has been made by the Field Worsted Mill, manufacturers of men's wear on 12 looms. The reason given is that the funds of the company are tied up in stock and finished goods. C. M. Gage is the assignee. It is stated that business will be continued.

New York, Cohoes. Judge Ray of the United States District Court has issued an order declaring the Walker & Harp Mfg. Co. involuntary bankrupts, referring the proceedings to Edwin A. King as referee. The company, which manufactured medicated cotton batting, etc., has a capital of $40,000. Hayes W. Walker, president; Jos. A. Leggett, treasurer; F. W. Carrington, secretary, and Alfred V. Walker. A bleachery was also operated in conjunction with the plant.

New York, New York. A petition in bankruptcy has been filed against Blecher, Eiseman & Co., manufacturers of braids, etc., 460 Broome St., and Augustus H. Skillen has been appointed receiver. The liabilities are estimated at $30,000 and the assets at $20,000 to $25,000.

New York, Troy. A receiver has been appointed for the Wayside Knitting Mill on petition of Mrs. Marion W. Rowe of New York. The Wright's Health Underwear Co. has leased the plant.

New York, West Eaton. On petition of the Star Woolen Co., George P. Pudney has been appointed receiver for the Fraser Dale Woolen Co. The mill will be closed and the assets sold. The Fraser Dale Co. operated 3 sets and 22 broad looms on woolens.

Pennsylvania, Philadelphia. Creditors have filed a petition to have the Wellington Worsted Mills, at Wayne Junction, adjudged an involuntary bankrupt. The creditors and the amounts claimed are Hodgson Bros., $2,460; Industrial Worsted Company, $4,450; and William Barber, $2,609.14. Alfred Patchett has been appointed the receiver under security of $10,000. The Wellington Mills, which are located in the Cope Mills, manufactured dress goods on 46 looms, the production being sold direct and through New York.

Pennsylvania, Philadelphia. Creditors have filed a petition to have Samuel L. Prince, of Jasper and York Sts., adjudged an involuntary bankrupt. The creditors and the amounts claimed by them are: Hulton Dyeing & Finishing Co., $911.69; Crawshaw Wolfenden, $568.26, and A. W. Allen, $245.85. The petition being received by the Courts, Crawshaw Wolfenden was appointed receiver under a bond of $10,000. S. L. Prince manufactured plain and novelty dress goods on 50 broad looms which be sold direct.

Pennsylvania, Reading. Paul Driesel and Gustave Ripka, operating under the name of Driesel & Ripka, manufacturers of women's cotton ribbed underwear, with five knitters and four sewing machines, at Fifth and Court Streets, have had a petition filed against them by their creditors asking that they be adjudged involuntary bankrupts. The creditors and the amounts claimed by them are: Scott & Williams, $1,762.12; Catlin & Co., $334.19; and the Neversink Dye Works, $1,396.

FIRES.

Maine, Bangor A fire destroyed the plant of the Berlin Knitting Co., at 70 Exchange St., causing a loss of about $3,000, fully covered by insurance. The equipment consisted of 18 Lamb knitting machines and 16 sewing machines, operated on sweaters.

Michigan, Saginaw. A fire in the Jones Block at the corner of Court and Hamilton Sts. destroyed the Saginaw Knitting Mills Co.'s plant. The loss is $1,200, fully insured. All kinds of fancy knit goods were manufactured on six knitting and two sewing machines.

New York, Rome. A fire in the plant of the Columbia Knitting Mills at the corner of Front and Washington Sts. caused damage of $5,000.

Pennsylvania, Philadelphia. The Dale Mills on Gillingham St., Frankford, were almost destroyed by fire on Wednesday morning. The tenants and the class of goods manufactured are as follows: Thomas Allen, upholstery goods and damask table covers, 7 looms; Thomas Allen, beamers of plain and fancy warps; ingrain carpet plant, of which Thomas Graham is the manager, 12 looms; Royle & Campbell, damasks and novelties, 7 looms. The mill will be repaired and started up again as soon as the insurance is adjusted.

Pennsylvania, Philadelphia. The Miller Waste Manufacturing Co., located on Martha St., above Huntingdon, one of the new concerns recently started in this city, has been destroyed by fire. The company had a capital of $20,000 and up to the time of its destruction has been doing a good business.

Pennsylvania, Philadelphia. The Spring Lawn Rug Mills, owned and operated by the Spring Lawn Manufacturing Co., located at Lewisville, Chester Co., Pa., a short distance from Elkton, Md., has been destroyed by fire. The loss is estimated at $25,000. The company, which has a capital of $20,000, A. E. Stephenson, president, John Lawrence, vice president, and William Willard, secretary and manager, and whose office is located in this city at 2553 N. 2d St., report that they do not know as yet what action they will take in the matter as to rebuilding, etc. They are manufacturers of rugs on 12 broad looms and state that they have large orders on hand to be filled.

FACTS AND GOSSIP.

Arkansas, Nashville. M. R. McMahon of Knoxville, Tenn., has purchased the Arkansas Woolen Mill, Inc., and is reported expects to put it in operation at an early date. The property has been in the hands of a receiver and has been shut down for some time. One set and 11 narrow looms are the machinery equipment.

California, Marysville. The Marysville Wool Scouring Co. has voted to issue 140 shares, par value $100, of its authorized capital stock of $100,000. N. B. K. Brooks of Boston is president.

Canada, New Brunswick, St. John. G. W. Jones, president of the Cornwall & York Cotton Mills Co., states that this company has no desire to dispose of the plant and reports that the Canadian Colored Cotton Mills Co. are negotiating for its purchase are incorrect.

Canada, New Foundland, St. John. The Colonial Cordage Co., Ltd., has discontinued manufacturing at this place.

Canada, Quebec, Montreal. A settlement has been reached in the strike of cotton mill operatives of the Dominion Textile Co., Ltd., and practically all have decided to return to work. The mills at St. Henri and Hochelaga have been opened and 200 people given work. More hands will be taken on as required.

*Connecticut, Meriden. Preparations are being made by the Meriden Curtain Fixture Co. for the removal of their plant to Minetto, N. Y. Business will be done hereafter at the Minetto-Meriden Co. We reported the probability of their moving several weeks ago.

Connecticut, Moosup. After running four days a week for the past two months, the Aldrich Mfg. Co.'s plant has returned to full time. Fine cotton goods are manufactured on 16,886 ring, 19,360 mule

spindles and 920 looms. It is reported that construction work will be started shortly on a large addition.

Connecticut, Windsor Locks. The mills of the J. R. Montgomery Co., manufacturers of colored and fancy cotton warps and novelty yarns, which has been running two-thirds time for a number of weeks, have resumed the full time schedule.

Georgia, Columbus. C. F. Sharpe of Nashville has secured an option of a tract of land comprising 672 acres just north of Columbus. It is rumored that a cotton manufacturing company will be formed.

*Kentucky, Covington. Some time ago it was reported that the Reliance Textile & Dye Works has purchased a lot containing 14 acres and suitable for manufacturing, at Lockland, Ohio, ten miles from Cincinnati. It is now reported that the Reliance Co. proposes to build a large dye works and homes for operatives on the site. It is not known how soon work will be commenced. Putnam, Hooker Co. of Cincinnati are interested in the project with the Reliance Textile & Dye Works.

Maine, Old Town. F. R. Smith & Co. of Pittsfield have made a proposition to the bondholders of the Maine Woolen Co. for a lease of the plant, which has been accepted.

Massachusetts, Fall River. A reduction of wages in all departments of from 5 to 10 per cent. has been made in the Kerr Mills of the American Thread Co.

Massachusetts, Lawrence. The plant of Brown & Whittier, which has been operated on a curtailed schedule for some time, has begun on full time. It is stated there are orders enough on hand to warrant a continuance of the full operations indefinitely.

Massachusetts, Lawrence. The top making department of the Arlington Mill is being run overtime to keep up with the demand.

Massachusetts, Lynn. Foundations for a 6-story factory building are being put in on Harrison Court to suit prospective tenants. The first story will be completed about July 1. Dimensions are 99 by 111 ft., which will provide about 11,000 ft. of space on each floor. But one story will be completed at present unless factory space is desired by tenants, in which case the full six stories will be built.

*Massachusetts, New Bedford. At a stockholder's meeting of the Taber Mill it was voted to increase the capital stock of the organization $130,000, making the capital stock $950,000.

Massachusetts, North Chelmsford. An explosion in one of the boilers of the Moore Spinning Co. necessitated a brief suspension of operations. Damage has been repaired and manufacturing resumed.

Massachusetts, Pittsfield. The Airedale Mills Co. has returned to full time with a full number of operatives. No further curtailment is expected.

Massachusetts, Uxbridge. The Uxbridge Worsted Co. is running overtime. Worsted and cotton goods are made on 66 narrow looms.

Massachusetts, Waltham. A marked improvement has taken place in local business conditions and the Waltham Bleachery & Dye Works are running the full time of 58 hours a week. The improvement appears permanent.

*Massachusetts, West Stoughton. The Stoughton Mills have been incorporated in Massachusetts with capital stock of $75,000 by Reuben Broomfield, Edward F. Maguire and Morris Tobey. This corporation takes over the business of the Stoughton Mills, manufacturers of extracts and shoddies on 14 sets. The Boston office of this company will be located in future at 170 Summer St.

Mexico, City of Mexico. It is reported that the International Harvester Machine Co. of Chicago will start a hemp factory in this district, utilizing a plant formerly used for this purpose, but which has been idle for a number of years.

Mexico, Orizaba. An English thread company has sent Francisco Rokey and Laurens Lillis to this place to make a report on the facilities for starting a thread manufacturing plant.

Mexico, Orizaba. It is reported that Pablo and Frederico Strodel will open a new cotton mill under the name of Fabrica Orizaba. They will occupy an old building which is being extensively repaired preparatory to the installation of machinery.

Mississippi, Vicksburg. A cotton warp and twine mill may be started here within a few weeks. J. E. Nelson is associated with other parties in this enterprise.

Nebraska, Lincoln. A. La Mont Chase, a lawyer with offices at 210-212 Farmers' & Merchants' Insurance Bldg., is in touch with parties who contemplate going into the cotton mill business in Oklahoma for the manufacture of muslins. They are desirous of interesting parties who are familiar with cotton manufacturing and who will invest a small amount of money in the enterprise.

New Hampshire, Dover. One of the drying cans in the print works of the Cocheco Mfg. Co. exploded, damaging the machine, but causing no further loss.

*New Hampshire, Meredith. The penstock of the Atlas Linen Corp. is being repaired and it is expected that the company will resume manufacturing in about two weeks.

New Jersey, Camden. The business of Joseph Hussong, proprietor of the Camden Dye Works, 615 Pearl St., has been taken over by the Jos. Hussong Company, a corporation chartered with capital stock of $25,000. The incorporators are F. B. Hussong, H. L. Hussong and E. L. Bartlett, all of Camden. The company dyes woolen and worsted skein yarns and slubbing.

*New Jersey, Paterson. The Continental Silk Co. is making arrangements to remove its plant from this city to a location of the new branch mill at Phillipsburg.

New Jersey, Paterson. A deal which probably means the erection of a new bleachery was com-

pleted when John Thomann of Patchogue, L. I., acting for other parties, purchased the Alyea property in Bergen County near the Wagaraw Bridge, comprising about 60 acres. It is understood that a corporation has been formed with capital stock of $500,000 and will immediately begin work on the construction of a plant. It is reported that John Logan will have charge of the bleachery.

New Jersey, Paterson. The Passaic Silk Co. has been incorporated with capital stock of $100,000 by Barnett Bornstein, Anthony B. Hopper and Walter R. Hudson. It is understood that the corporation will take over the business of B. Bornstein and E. Trachsler, a co-partnership operating plant of 56 looms on broad silks at 50 Washington St.

New Jersey, Paterson. The Warner Mfg. Co., reported incorporated last week as the Warren Mfg. Co., has capital stock of $10,000. Hugo H. Piesen of New York is pres., and Frank Warner of Paterson is treas., agent and buyer. The new corporation takes over the business of the Warner Mfg. Co., operating five looms at 15 Prince St. Woven silk labels and printed linen and shirt labels are manufactured. The New York office is at 817 Broadway.

New Jersey, Paterson. The local dye houses are nearly all busy on orders, some of them working overtime, which shows the increasing trade in the silk business. The increasing price of raw silk is the only factor disturbing local manufacturers just now.

New York, Albany. Articles of incorporation have been filed by the United Textile Corporation, with authorized capital stock of $2,000,000. Permanent organization has been perfected by the election of the following officers and directors: Joseph S. Mack, pres.; Wm. R. Yeager, 1st vice pres.; Thos. Kenney, 2d vice pres.; John A. McCollom, sec. and Leo. E. Schinpff, treas. Directors are J. S. Mack, Leo Schinpff, John A. McCollom, Thomas Kenney, Thomas Lewis, Wm. A. Lush, Hugh E. Crilley, C. M. W. Kech, John Schwartz, Jr., John W. Fitzpatrick, George W. Aubrey, A. F. Mack, John M. Mack and Wm. R. Yeager. The following statement was made by Pres. Mack: "The United Textile Corporation has been formed for the purpose of acquiring control of the Jos. S. Mack Silk Co., the Queen City Silk Co., the Lecha Silk Co., the Unity Silk Co. and the Providence Silk Co." The principal offices of the company will be in New York City.

*New York, Brooklyn. The Balsam-Alexander Co., reported incorporated in May, is a reorganization of the D. M. Balsam Co., which manufactures men's and women's neckwear, belts and similar goods. They are interested in electric fans, motors, elevators, employes' time recorders and electric cutting knives.

New York, Cohoes. The Granite Mills, Wm. Moore Knitting Co., Inc., are running on full time and are reported to have plenty of orders ahead.

*New York, Delhi. Walter Dornitzer bought the Delhi Silk Mill property, which was sold at auction by H. G. Hewitt, the referee in the mortgage foreclosure action. The price paid for the property, which includes the engine, boiler and a large portion of the machinery, was $5,000. It is understood that Mr. Dornitzer expects to sell the property to parties who will at once commence running it. The plant has been shut down for a number of weeks.

New York, Falconer. The Lynndon Worsted Co. has increased its capital stock from $75,000 to $200,000. It is understood that the increase will be used for enlarging and improving the plant.

*New York, Gouverneur. It is probable that the International Lace Mfg. Co.'s plant will be started up in July by Jos. H. Bromley of Philadelphia. The Bromleys purchased the equipment of the Tarriffville Lace Mfg. Co., Tarriffville, Conn., which shut down recently and are removing it to this place.

New York, New York. Judge Holt has granted a discharge in bankruptcy to John J. Robinson, manufacturer of braids, trimmings and novelties, located at 18 West 18th St. Liabilities, $190,700.

New York, New York. The control of the American Silk Co., which went into the hands of a receiver last November will be in the hands of seven directors, consisting of two selected by creditors and five by the stockholders. They include the following: H. L. Gwalter and A. K. Breuss, representing the creditors, and B. P. Cheney, M. G. Collins, Eugene H. Burchkardt, B. E. Sheibley and Douglas St. Claire, representing the stockholders. President Collins in a statement says that with the cash working capital now on hand, the company will be able to operate all its mills.

New York, New York. The firm of Reiling, David & Schoen dissolved on June 1, 1908, by mutual consent and on the same date, the limited partnership of Reiling & Schoen was organized. Mr. Joseph L. Reiling and Mr. Carl Schoen are general partners and Mr. B. Edmund David is special partner. Messrs. Reiling & Schoen have taken over all the assets and will collect the bills receivable, and have assumed and will pay the liabilities of, the former firm of Reiling, David & Schoen. The office at 97-99 Greene St. will be continued. This firm operates plants at Valley Falls, R. I., West Hoboken and West New York, New Jersey and Scranton, Pa.

*New York, Sidney. The shut down of the local plant of Julius Kayser & Co. is in the nature of the annual summer vacation given by this firm. The date of closing has not been decided upon and no repairs are contemplated.

*North Carolina, Clinton. D. M. Partrich advises that the project for the erection of a 5,000-spindle cotton mill has been abandoned for the present.

North Carolina, Concord. A committee appointed at a joint meeting of the creditors and stockholders of the Odell Mfg. Co. decided there would be a sale of the property by the receiver. It is planned that a new corporation shall be organized by such present stockholders as desire to contribute new capital. $200,000 in new capital will be invested and the plant thoroughly modernized.

*South Carolina, Greenville. The creditors of the Huguenot Mill have decided to again advertise the property for sale by public auction on Wednesday, July 8. It will be remembered that the previous effort to sell the property by auction was not successful, the only bid being one of $50,000 from the stockholders, which the creditors refused to accept.

*South Carolina, Liberty. A proposition is before the directors of the Liberty Cotton Mills for increasing the capital stock from $175,000 to $200,000.

South Carolina, Sumter. The Sumter Land Co. is reported to be contemplating the erection of a cotton mill company. No definite information has been given out.

*South Carolina, Union. After a careful examination of the Aetna Cotton Mills, Mr. Alfred Moore, who was elected trustee, advised that the mill be shut down, which has been done. The creditors previously decided to continue the mill in operation and sell it as a going concern. It is understood that in a short time an order will be taken for the sale of the entire property and that the prospective purchaser will reorganize the company and resume operations immediately.

Texas, Galveston. The Business Men's League is planning to organize a company to establish a mill for manufacturing bagging.

Texas, Fort Worth. W. J. Bryan of Albilene has a proposition to have the State engage in the manufacture of cotton bagging in connection with the penitentiary.

Texas, Houston. The Texas Bag & Fibre Co., manufacturers of cotton and burlap bags, will build a warehouse 3 stories high, 50 by 50 ft. The estimated cost is $6,500 and building will be completed in August.

Texas, Weatherford. The Weatherford Cotton Mill will probably resume operations about September 1. At present, the plant is shut down.

Utah, Provo. The Citizens' Club has been organized and will soon have a conference with the directors of the Provo Woolen Mills Co. with a view to having the mills resume.

Vermont, Ludlow. A change has been made temporarily in the line of goods manufactured at the Black River Woolen Co. Suitings are being turned out instead of the overcoatings and cloakings on which the mill has been run for a number of years.

West Virginia, Guyandotte. The Guyandotte Woolen Mill Co. has shut down its plant indefinitely. A rumor states that H. W. Stewart, president and treasurer of the concern and the largest stockholder, is disposed toward dismantling the plant and going out of business.

Personals.

Farrell Coyle, foreman of the printing department of the Windsor Print Works, North Adams, Mass., has severed his connection with that company after twenty-three years of service.

Stephen Coyne, for 27 years in charge of the Pentogrith room of the Windsor Print Works, North Adams, Mass., was found on the fourth floor of the Windsor House suffering from a stroke of apoplexy. He had been employed at the Windsor Print Works for a number of years, coming from Lowell, Mass.

Jeremiah C. Reed of the East Side, Paterson, N. J., has been selected chairman of the Board of Trade. Mr. Reed was formerly connected with Reed & Lovatt, silk throwing manufacturers.

Henry Lord, formerly overseer of weaving at the Indian Spring Mills, Madison, Me., but later superintendent of the Seneca Falls Woolen Company, Seneca Falls, N. Y., has resigned.

R. T. King, overseer of the cloth department of the Androscoggin Mills, Lewiston, Me., has severed his connection with that company.

W. D. McDonald has resigned as night superintendent for the Maple Mills, Dillon, S. C. He is now connected with the Kingston Cotton Mills, Kingston, N. C.

Alexander Costine, who succeeded E. S. Creamer, superintendent of the Wellington Worsted Mills, Philadelphia, Pa., has severed his connection with that company and is now conneeted with Chas. Porter & Sons, men's wear manufacturers, same city.

Frank A. Snyder is now the Philadelphia selling agent for the Boston Yarn Company, Boston, Mass., which sells for the Le Roy Cotton Mills and also the Warner Cotton Mills.

Benjamin E. Taylor and Edward D. Merikle, who were both associated with John Given for a number of years, have formed a partnership under the firm name of Taylor & Merikle and opened a sales room at 350 Broadway, New York City.

P. D. Wade, superintendent of the four mills operated by the Pelzer Mfg. Company, Pelzer, S. C., has resigned. J. H. Merritt succeeds Mr. Wade in mills Nos. 1, 2 and 3 and J. M. Alexander has been appointed superintendent of Mill No. 4.

T. McEntire has been appointed superintendent of the Loray Mills, Gastonia, N. C., succeeding B. J. Robbins.

B. J. Murphy, overseer of carding at the Geneva Mills, Wanskuck Company, Providence, R. I., has resigned and accepted a similar position with the Middlesex Mills, Lowell, Mass.

The degree of Doctor of Science was recently conferred by Dartmouth College on C. J. H. Woodbury, secretary of the National Association of Cotton Manufacturers. This is the second time that Mr. Woodbury has been the recipient of this degree. The first was when it was conferred by Union College of New York.

Peter Costello, Sr., has accepted a position as overseer of finishing at the Litchfield Worsted Mills, Clinton, Mass.

H. G. McFalls, overseer of carding in the Louise Mills, Charlotte, N. C., has purchased the Virginia Roller Covering Shop, connected with the Charlotte Mills and will remove same to Lincolnton, N. C.

J. W. Broadnas, formerly overseer of spinning at the Victoria Mills, Rock Hill, S. C., but who recently accepted a position at Kansas City, has returned to his home in Rock Hill.

Robt. E. Ligon has been elected president of the Liberty Cotton Mills, Liberty, S. C., succeeding J. P. Smith, who resigned.

E. L. Sargent, superintendent of the Atherton Mills, Charlotte, N. C., has resigned and accepted a similar position with the Fidelity Mfg. Company of that city, where his brother, S. B. Sargent, is secretary and treasurer.

David Welch, overseer of finishing at Thos. Oakes & Company, Bloomfield, N. J., has severed his connection with that company and accepted a similar position with the Waterloo Woolen Mfg. Company, Waterloo, N. Y.

Thomas Hennessey, formerly overseer of carding at the Arcadia Yarn Company, Arcadia, R. I., has accepted a position with the Uncasville Mfg. Company, Versailles, Conn.

Wm. Ivins, Jr., vice president of the firm of Ivins, Dietz & Merzger, carpet manufacturers, died at his home, 2213 Tioga St., Philadelphia, Pa.

Chas. E. Safford has accepted the position as overseer of finishing at the Faulkner Mfg. Company, North Billerica, Mass. He was formerly employed at the Robinson Mills, South Windham, Me.

Louis J. Raymond, assistant master mechanic at the Grant Yarn Company, Fitchburg, Mass., has severed his connection with that company.

J. W. Fitzsimmons has been appointed superintendent of the Troy Knitting Company, Troy, N. Y.

James Helliwell, overseer of the worsted drawing at the Milwaukee Worsted Mills, Milwaukee, Wis., has resigned. His successor is Arthur Brewerton of Worcester, Mass.

Geo. MacAlpine has accepted the position as designer for the Victor Mfg. Company, Clinton, Mass., succeeding James H. Redmond.

J. C. Norton, formerly overseer of carding and spinning at Matoaca, Va., is now employed at the Dan River Mills, Danville, Va.

W. B. Wicker has accepted a position as overseer of weaving at the Glen Raven Mills, Burlington, N. C. He was formerly employed at the Rosemary Mfg. Company, and also the Rhode Island Mills, Spray, N. C.

A. A. MacWhinnie, manager and superintendent of the Savannah Cotton Mills, Savannah, Ga., has severed his connection with that company.

Julius Bernard has severed his connection with the Slayden-Kirksey Woolen Company, Waco, Texas, as designer.

Ralph Hill has accepted the position as designer for the Faulkner Mills, Stafford Springs, Conn. He comes from Pontoosuc, Mass.

H. B. Hazen has accepted a position at the Rhode Island Worsted Company, Stafford Springs, Conn., in the sample department.

John McMillan has accepted the position as overseer of dyeing at the Naushon Company, Valley Falls, R. I. He was formerly employed at Fall River, Mass.

Ariel C. Thomas, agent of the Boott Mills, Lowell, Mass., has severed his connection with that company after six years of service. J. H. Whitten, who has been at the mill since January, coming from Manchester, N. H., has now charge of the mill.

Thomas Armitage has accepted a position in the carding department of the Paton Mfg. Company, Sherbrook, Canada. He comes from Lawrence, Mass.

W. E. Poag has accepted the position as overseer of carding and spinning at the German-American Mill, Draper, N. C. He was formerly employed at Roanoke Rapids, N. C.

L. A. Gilbert, overseer of carding at the Saunders Cotton Mills, Saundersville, Mass., has severed his connection with that company.

J. Scott has accepted the position as overseer of spinning at the Vassalboro Mills, No. Vassalboro, Me., succeeding Wm. Hartley who resigned.

J. H. Davenport has accepted the position as overseer of dyeing for the Uxbridge Worsted Company, Uxbridge, Mass. He comes from Oswego, N. Y.

James H. E. O'Kelly has accepted the position as chief engineer and master mechanic at the Courtnay Mfg. Company, Newry, S. C. He was formerly employed at Greenville, N. C.

Wm. R. Thigpen has accepted the position as overseer in the cloth department of the White Oak Mills, Greenville, N. C. He was formerly employed at this same mill.

J. B. Brannon will continue as superintendent of the Union-Buffalo Mills at Union, S. C., and J. F. Duggett as superintendent of the Union-Buffalo Mills at Buffalo, S. C.

B. J. Dobbins has accepted the position as general superintendent of the Henrietta and Caroleen Mills of North Carolina. He comes from the Loray Mills, Gastonia, N. C.

John R. Frye has accepted the position as overseer of carding and spinning at the Sterling Cotton Mills, Franklinton, N. C. He comes from the Royal Cotton Mills of Wake Forest, N. C., and succeeds J. C. Fogleman.

G. B. Hamby has accepted a position as overseer of weaving at McComb City, Miss. He comes from Tupelo, Miss.

J. M. Short has accepted the position as overseer of spinning at the Cherryville Mfg. Company, Cherryville, N. C.

Geo. Stewart has accepted the position as overseer of carding and spinning at the La Fayette Cotton Mills, La Fayette, Ga.

Geo. A. Westbroke has again entered the employ of the Orrell Mills, Glendale, R. I., as overseer of dyeing. He was formerly employed at this mill as overseer, but more recently with the Nasonville Worsted Mills, Nasonville, R. I.

Charles E. Lawrence has been appointed local manager of sales for the Massachusetts Fan Co., with headquarters in the Hudson Terminal Bldg., 50 Church St., New York City.

Frederick Johnson has accepted a position in charge of the dry finishing at the Bound Brook Woolen Mills, Bound Brook, N. J. He comes from Philadelphia, Pa.

Geo. F. Simmons, overseer of gigging at the Bound Brook Woolen Mills, Bound Brook, N. J., has severed his connection with that company.

C. E. Donovan, overseer of weaving at the Jewell Brook Woolen Company, Ludlow, Vt., has accepted a position as boss weaver at the Brampton Woolen Company, Newport, N. H., succeeding T. J. Nevins.

T. B. Wallis, superintendent of the Consolidated Cotton Duck Mills, of Columbia, S. C., has resigned and the position has been filled by Daniel Gray, distributing manager, until his successor is appointed.

Robert Stewart, assistant superintendent at the Lonsdale Company's Mill, Ashton, R. I., has been appointed superintendent of the Lonsdale Company, to succeed E. A. Mongeon.

Wm. B. Tobey has resigned the position as agent and treasurer of the North Berwick Mills, North Berwick, Me.

John McElwaine, overseer of dyeing at the North Berwick Mills, North Berwick, Me., has resigned and accepted a position at Gonic, N. H.

Luther W. Packard has accepted a position as agent and superintendent of the North Berwick Mills, North Berwick, Me. He was formerly employed by Geo. E. Kunhardt, Lawrence, Mass.

Geo. E. Stephens has accepted a temporary position as overseer of weaving at the Trenton Worsted Company, Methuen, Mass. He comes from Hinsdale, N. H.

Edward Ambach, overseer of carding at the Glen Mills, Norwichtown, Conn., has resigned and accepted a similar position with the Geneva Mills, Wanskuck Company, Providence, R. I.

Timothy Mooney has accepted the position as superintendent of the New York Mills, New York Mills, N. Y.

Charles C. Pierson, superintendent of the Arkwright Mills, Fall River, Mass., has resigned his position on account of ill health.

E. T. Barnes, for the past two years connected with the cotton mills at Siluria, Ala., has accepted a position as overseer of spinning at the Wariota Mills, Nashville, Tenn.

W. S. Moore, overseer of carding at the Victor Mills, Greer, S. C., has accepted a position as superintendent of a mill at Arcadia.

S. P. Shipper, assistant superintendent of the duck department for a large mill at Columbia, S. C., has been appointed superintendent of the Saxegotha Cotton Mills, Irene, S. C.

W. W. Creighton has accepted a position as roller coverer at the Cooleemee Cotton Mills, Cooleemee, N. C. He comes from Charlotte, N. C.

P. P. Geyder has accepted a position as machinist at the Cooleemee Cotton Mills, Cooleemee, N. C. He comes from Wilmington, N. C.

James F. Brown has taken charge of the cloth room at the Aragon Mills, Aragon, Ga. He was formerly employed at Griffin, Ga.

James Allen has accepted a position as overseer of spinning for the Sheridan Woolen Mills, Ashuelot, N. H. He was formerly employed at the Sawyer Mills, Dover, N. H., and succeeds his brother, Matthew Allen, who has accepted a position at the Burlington Mills, American Woolen Company, Winooski, Vt.

P. F. Whalen, designer for the Daniels Worsted Company, Worcester, Mass., has severed his connection with that company and accepted a similar position with the Nanquit Worsted Mills, Bristol, R. I.

James W. Williams has accepted the position as overseer of carding at Amos Abbott & Company, Dexter, Me. He was formerly employed at Upper Troy, N. Y.

Geo. Baxter has accepted the position as designer for the Taft Woolen Company, Careyville, Mass. He was formerly employed at Strong Hewat Company, North Adams, Mass.

James Ramsey has accepted the position as overseer of spinning at the Plainfield Woolen Company, Central Village, Conn.

Windfield Blackburne has acceped a position as overseer of spinning at the Faulkner Mills, Stafford Springs, Conn., succeeding his brother, Chas. Blackburne, who has accepted a position as overseer of spinning at the Pawcatuck Mills, Westerly, R. I.

William E. Kern, Jr., was elected treasurer to succeed Frank P. Macy at a meeting of the directors of the Taber Mill, New Bedford, Mass., held recently. He comes from the Whitman Mills.

Joseph Potter, for a number of years overseer of weaving at the Quinebaug Mills, Danielson, Conn., died at Chillicott, Ohio, at the age of 85 years.

Frank Perkins, overseer of finishing at the Rhode Island Worsted Company, Stafford Springs, Conn., has severed his connection with that company.

Fred Lacey, superintendent of the Boott Mills, Lowell, Mass., is to succeed Ariel C. Thomas, as agent.

Thomas Keefe has accepted the position as overseer of dyeing at the Morrison Woolen Company, Dexter, Me.

A. W. Smith has succeeded T. Tower as overseer of dressing at the Falls Company, Norwich, Conn. Mr. Tower has accepted a similar position with the Dwight Mfg. Company, Chicopee, Mass.

John E. Bradley has accepted a position as overseer of dyeing at the Knoxville Woolen Mills, Knoxville, Tenn. He was formerly employed at the Rock Mfg. Company, Rockville, Conn.

Elias Willis has accepted a position as boss carder at the Danielson Cotton Company, Danielson, Conn. He comes from Taunton, Mass.

Wm. P. Holt superintendent of the Warren Cotton Mills, West Warren, Mass., has severed his connection with that company after two years of valuable service. He succeeded Geo. A. Moody in May, 1906, and on the death of Chas. H. Hobbs, in September of the same year, he became general superintendent, Walter B. Hall, of Lowell, Mass., being made agent February 17.

J. O. Sweet, treasurer and agent of the Ashland Cotton Company, Jewett City, Conn., has resigned. Mr. Sweet has been treasurer and agent of this company for a number of years and his departure is regretted by the people under his employ.

J. M. Cannon, assistant superintendent for the F. W. Poe Mfg. Co., Greenville, S. C., has been engaged as superintendent of the Simpsonville Cotton Mills, Simpsonville, S. C., a new mill which is being built for the manufacture of cotton goods.

Edward T. Dolan, formerly manager of the Dolan Hair Cloth plant at Lockport, N. Y., and previously at Niagara Falls, but more recently appointed to the management of a large manufacturing concern at Providence, has arranged for the removal of his household effects to his new home at Providence, R. I.

Amory Eliot has been elected a director of the Atlantic Cotton Mills, Lawrence, Mass., succeeding Louis Dabney, deceased.

William H. Dooley, principal of the Lawrence Industrial School, Lawrence, Mass., has been appointed special agent of the United States Government and has sailed for Europe.

John P. Abbott, assistant manager of the Apponaug Company, Apponaug, R. I., has severed his connection with that company and accepted a position as sales agent for the United Finishing Company.

Fred Cushing has accepted the position as overseer of dyeing at the Geneva Mills, Providence, R. I. He is the son of R. H. Cushing, superintendent of this mill, and succeeds Geo. Westbrooke, who has returned to his old position at Glendale, R. I.

Geo. E. Bidwell has accepted the position as overseer of finishing at the Marston Worsted Mills, Skowhegan, Me. He comes from Woonsocket, R. I.

Julius Bernhard has accepted a position as designer at the Auburn Woolen Company, Auburn, N. Y. He was formerly employed at the Slayden-Kirksey Woolen Mills, Waco, Tex.

Ernest Rhodes, who recently accepted a position as designer for the Excelsior Mills, Farnumsville, Mass., has resigned and accepted a similar position with James & E. H. Wilson, Pittsfield, Mass.

W. S. Lowe has accepted the position as overseer of knitting at the Wina Mills, New Haven, Conn. He comes from Laconia, N. H.

Frederick W. Sawyer has accepted the position as cloth examiner for the Excelsior Mills, Farnumsville, Mass.

R. F. Adams, overseer of spinning at the Dresden Cotton Mills, Lumberton, N. C., has resigned and accepted a similar position at the Liberty Mills, Clayton, N. C.

W. A. East, overseer of spinning at the Warioto Cotton Mills, Nashville, Tenn., has resigned after several years of service.

E L. Lynch, second hand in the weaving department of the Warioto Cotton Mills, Nashville, Tenn., has been promoted to the position as overseer, a position made vacant by the resignation of J. T. Morris.

J. T. Morris, overseer of weaving at the Warioto Cotton Mills, Nashville, Tenn., has severed his connection with that company. He was formerly employed at the Hoskins Mill, Charlotte, N. C.

P. T. Donahue, formerly overseer of finishing at the Montrose Woolen Mill, Woonsocket, R. I., but more recently with the Excelsior Mills, Farnumsville, Mass., has resigned his position at Farnumsville and it is reported is to accept a similar position at Greenville, R. I.

James McKaye has accepted the position as overseer of weaving at the Hamilton Mfg. Company, Lowell, Mass., succeeding Herbert E. Davis. Mr. McKaye was formerly employed at Salmon Falls, N. H.

Herbert E. Davis, formerly overseer of weaving at the Hamilton Mfg. Company, Lowell, Mass., has accepted the position as superintendent of the Warren Cotton Mills, West Warren, Mass., succeeding Wm. P. Holt, who resigned.

Edward Dufresne, one of the oldest and most respected residents of Lawrence and for more than half a century an employee at the Atlantic Cotton Mills, of that city, has retired and will enjoy a long and well earned rest. He entered the employ of the Atlantic Corporation June 20, 1855.

John Waugh has accepted the position as overseer of carding at the Passaic Woolen Company, Passaic, N. J. He was formerly employed at Norwich, Conn.

Norman L. Kilcut has been appointed assistant superintendent of Geo. E. Kunhardt's mill, Lawrence, Mass., succeeding Luther W. Packard.

James A. Lapraik has taken charge of dyeing for the Faulkner Mfg. Company, North Billerica, Mass. He formerly held the position as second hand at the Sutton Mills, North Andover, Mass.

Geo. Templeton has accepted the position as overseer of finishing at the Vernon Woolen Company, Vernon, Conn. He was formerly employed at Broad Brook, Conn.

Henry C Templeton, overseer of finishing at the Waterloo Woolen Mfg. Company, Waterloo, N. Y., has resigned and accepted a position as overseer of finishing at the Beaver Brook Mills, Collinsville, Mass.

John T. Lyons, who recently accepted the position as overseer of finishing at the Beaver Brook Mills, Collinsville, Mass., has resigned and returned to his old position at the Clinton Mills, Norwich, Conn.

Jos. H. Senovely has accepted the position as overseer of carding at the Falls City Woolen Mills, Louisville, Ky. He comes from La Porte, Ind.

Charles C. Pierson, superintendent of the Arkwright Mills, Fall River, Mass., since they started some years ago, has resigned on account of ill health.

Joseph Bourbeau has re-entered the employ of the H. T. Hayward Mills, Franklin, Mass., as overseer of finishing, succeeding J. A. Ring.

John B. Livesey has accepted the position as overseer of carding at the Saunders Cotton Mills, Saundersville, Mass., succeeding L. A. Gilbert, who resigned.

A. W. Smith has accepted the position as overseer of dressing at the Falls Company, Norwich, Conn., succeeding T. T. Tower, who has resigned to accept a position at the Dwight Mfg. Company, Chicopee, Mass.

John E. Bradley has accepted the position as overseer of dyeing for the Knoxville Woolen Mills, Knoxville, Tenn. He was formerly employed at the Rock Mfg. Company, Rockville, Conn.

Walter Gledhill has accepted a position as overseer of finishing at the Pawcatuck Woolen Mills, Potter Hill, R. I. He comes from Bound Brook, N. J.

Harry Smith has accepted the position as overseer of spinning at the Cheshire Mills, Harrisville, N. H., succeeding Joseph Scott, who has resigned to accept a position at North Vassalboro, Me.

Frank Brazeal has accepted a position as overseer of finishing at the Rhode Island Worsted Company, Stafford Springs, Conn. He was formerly employed at the Somerset Woolen Company, Monson, Mass.

Charles Taft has accepted a position as overseer of finishing at the Somerset Woolen-Company, Monson, Mass. He comes from Ware, Mass.

Harold E. Jones, bookkeeper at the Excelsior Mills, Farnumsville, Mass., has resigned and has left for Philadelphia where he will enter a preparatory school.

William Walmsley, overseer of weaving at the No. 3 Merrimack Mill, Lowell, Mass., has resigned and was presented with a handsome Masonic ring, which was given by the loom fixers and weavers.

Joseph A. Clause has been promoted to the position as overseer of the weaving for the Merrimack Corporation. Edward Hanson to the position as general second hand of the No. 3 Mill.

H. L. Pratt, who has for the past twenty-three years been agent of the Bates Manufacturing Co., Lewiston, Me., has resigned his position to take effect July 1st. Mr. Pratt's health has not been of the best for some time past and he retires from business in order to take a much needed rest. A successor has not yet been definitely appointed.

John Doyle, who has been second hand in the mending department of the Arlington Mills, Lawrence, Mass., has severed his connection with that company.

Oland Comstock, overseer of finishing at the Faulkner Mfg. Company, North Billerica, Mass., has severed his connection with that company.

John W. Crowther will sever his connection as superintendent at the Wakefield Mfg. Company, Wakefield, R. I., July 1st. It is reported that he and his brother, D. Crowther, who was superintendent of the Berkshire Worsted Mills, Pittsfield, Mass., will enter into business manufacturing worsted goods.

Frank G. Murch has severed his connection with the Arlington Mills and will enter into partnership with Geo. L. Selden, proprietor of the Selden Worsted Mills.

Ernest D. Royce has accepted a position as superintendent for the Faulkner Mills, Stafford Springs, Conn., succeeding Mr. Pfeifer. Mr. Royce was formerly employed at the Forestville Mills, same town.

John Kollet has accepted the position as master mechanic at the Wilton Woolen Company Wilton, Me. He comes from Woonsocket, R. I.

W. W. Bentley, general superintendent at Wm. Wood & Company, Pequea Mills, 22d and Spring Garden Sts., Philadelphia, Pa., has severed his connection with that company. His successor is Hugh Clayton.

Chas. Wolford, overseer of the sewing and cutting department at the Everett Mills, Lebanon, N. H., has severed his connection with that firm and accepted a similar position at Minneapolis, Minn.

DEATHS.

Chas. E. Lenck of the firm of Junod & Lenck, lace manufacturers, 75 Spring St., New York City, committed suicide on the fifth floor of their works as a result of illness. Death was the result of a pistol shot.

Robert Walker, employed at the Ponemah Mills, Taftville, Conn., for a number of years, died at his home in that town at the age of 60 years. He had been employed for this company 24 years, first in charge of the weave room and then of the cloth department.

James J. Dickson died at his home, 653 Dwight St., Holyoke, Mass., after a three months' illness. He had been employed at the Lyman Mills, Holyoke, Mass., for a number of years, having resigned about four years ago.

Leron W. Guild, wool buyer for the Pontoosuc Mills, Pittsfield, Mass., died at his home on North St. in that city, May 30th. He was well known in the Boston wool market, and was born in Woonsocket, R. I., in 1849. He is survived by his wife, four sons and a brother, Albert Guild of Walpole, Mass.

James B. Ward of the firm of James B. Ward & Bros., turkish towel manufacturers, Philadelphia, Pa., died at his home in that city May 22 at the age of 50 years.

J. S. Murdock, treasurer and secretary of the Charleston Bagging Mfg. Company, Charleston, S. C., died at his home in that city after a brief illness at the age of 74 years.

L. Banks Holt, a wealthy cotton manufacturer and interested in mills in Durham and Burlington, shot himself with suicidal intent at his home in Graham, N. C. Two years ago Mr. Holt was shot in the head at his home by a negro and had never fully recovered from the effects.

Charles Eugene McKaig died on June 9 and was buried from his late residence, 3334 North 13th St., Philadelphia, on Friday, June 12, at 1.30 P. M. Mr. McKaig, who has been ill for some time, was until his death prominently identified with the knitting industry in this city, being the senior member of the firm of Chas. E. McKaig & Co., operating the Milo Knitting Mills at Emerald and Adams Sts.

Adam S. Ballantyne, superintendent of the Tilton Woolen Mills Company, Tilton, N. H., died at his home in that town June 10 after an illness of seven months. He was a native of Scotland and had been connected with woolen mills in this country for the past forty years. Was also president of the Iona Savings Bank, of Tilton, N. H., and several years ago represented Tilton for one term in the New Hampshire legislature. He was 74 years of age, and leaves a wife, three sons and two daughters.

Orlando H. Alford, a member of the firm of Bliss, Fabyan & Company, Boston, died Thursday, June 11, at his home, 240 Kent St., Brookline, at the age of 66 years. Mr. Alford had been for many years identified with some of the leading financial and industrial interests in Boston. He was a director of the First National Bank, City Trust Co. and the Franklin Savings Bank, also a director of the Bates Mfg. Company, Columbus Mfg. Company, Cordis Mill, Thorndike Company, and a number of other enterprises.

P. Quinn, overseer of the dry finishing at the Middlesex Mills, Lowell, Mass., for a number of years, died after undergoing an operation at a hospital in Lowell, Monday evening, June 15. Mr. Quinn had been employed at the Middlesex Mills for a number of years and was highly esteemed by his fellow workmen.

Wm. O'Neal, at one time one of the best known mill overseers in New England, died at his home in New Bedford. He had charge of weaving in several of the large mills in that city and leaves a wife and one daughter.

Francis J. Primrose, a wool broker of Philadelphia, Pa., with office at 134 Chestnut St., died Tuesday, June 9, at the Northwestern Hospital, from injuries received in an automobile accident, May 23. He had been associated with the woolen industry for a number of years.

John S. Walling, 58 years of age, died suddenly last week at Providence, R. I. He had been connected with the woolen and worsted manufacturing business in Burrillville, R. I., for a number of years. Had recently resigned a position as superintendent of the Fred L. Sayles Company, Pascoag, R. I., on account of his health. He is survived by his wife and one son.

J. F. Montgomery, aged 23 years, and son of V. M. Montgomery, the well known cotton mill president of Spartanburg, S. C., died at his home in that city. The deceased was a popular young man and was bookkeeper in the office of the Pacolet Mfg. Company.

Abraham Wittcover, an embroidery manufacturer, died at the Bellwood Hotel in that city by inhaling illuminating gas. He was 32 years of age and lived at 284 Suydam St., Brooklyn, N. Y.

George Theodore Lyman, a prominent resident of Bellport, L. I., died at the home of his daughter in Milton, Mass. He was the son of George W. Lyman, one of the founders of the cotton manufacturing industry in New England.

William O'Neill, one of the pioneer textile manufacturers of Frankford, Philadelphia, died at Holly Beach, N. J., on June 14, 1908, in his 71st year. The remains were buried from his late home, 5104 Frankford Ave., in Greenwood K. of P. Cemetery on June 17, at 2 p. m.

William Appleyard of Guilford, Me., died at the home of his son, Thursday, June 18, at the age of 76 years. He was born in Bradford, England, in 1831. Mr. Appleyard leased the woolen mill at Guilford in 1873 and was very prosperous and in a short time bought the property. Shortly afterwards he acquired the Sebec Woolen Mill. He is survived by his son, Wm. Appleyard.

New Publications.

[Any work noticed under this head can be obtained through the office of this journal.]

The Official American Textile Directory for 1908; compiled by the Textile World Record; 650 pages; 23 textile maps; Lord & Nagle Company, Boston, New York and Philadelphia, publishers; office edition, $3.00; traveler's edition, $2.00.

The Official Directory for this year, which is the fourteenth annual edition, has been issued and can be supplied immediately upon order.

In many ways this year's Official Directory is superior to any similar book for the textile trade that has previously been compiled. The work of gathering information for the various departments was begun early in 1908. Then in May, two months ago, the whole industry was canvassed by representatives and by mail, verifying and amplifying reports which had come in through other channels and finding out other changes which had not been made public. The publishers, being also the publishers of the Textile World Record, utilized the extended reporting and news gathering facilities of their organization in this work. The result is that the directory has been compiled in a shorter space of time and with more thorough personal investigation than any other work of this character, bringing the information closer to the date of publication and insuring a higher degree of accuracy.

Two new features have been added in the 1908 Official Directory a classified list of manufacturers making cotton, woolen, worsted, silk, carpet and miscellaneous fabrics, arranged under suitable headings, and a list of textile associations in the United States and Canada. The classified list of cloth manufacturers combined with the classified list of yarn manufacturers, which has been included for the past few years, makes the only complete classified list of textile manufacturers in the United States that is published. The list of textile associations is more complete, by comparison, than any other list compiled and gives the names of associations, officers, and addresses at which they may be reached.

Some of the special features are as follows: A complete directory of textile mills of all classes with full information, such as name of company or firm, names of officers, character of goods made, and machinery equipment.

Copyrighted maps, by which any town referred to in the text can be quickly located on the map. There are twenty-three of these textile maps which show only the cities and towns where there are textile establishments. Railroad facilities, distance from other towns, etc., are shown.

A yarn trade index, which gives a classified list of manufacturers of different kinds of yarn who spin for the market; sizes of yarns spun and the way it is put up are given.

A classified list of cloth manufacturers, giving the classes of goods manufactured in every mill.

A commission and order section, giving classified lists of establishments doing all sorts of dyeing, bleaching, finishing, mercerizing, etc., on order for manufacturers and converters.

A list of mills with worsted machinery for the convenience of those dealing exclusively with that branch.

In this edition, indexes have been printed on different colored paper from the mill reports, enabling quicker reference to the section desired.

Other features are an alphabetical index, dealers in raw materials, selling agents and dry goods commission houses, machinery and supply section, and a list of the textile associations in the United States and Canada, with officers, addresses, etc.

Hundreds of new establishments have been included in the new Official Directory which have not previously been listed in any publication, and thousands of changes made, including a large number of mills which have gone out of business, have been taken out of the lists.

A complete descriptive circular will be sent by the publishers on application. Copies of either the office edition or the travelers' edition can be supplied immediately on order.

Slow Burning or Mill Construction; issued by the Boston Manufacturers' Mutual Fire Insurance Co., 31 Milk St., Boston, Mass.; price 25 cents.

The third edition of this work has recently been issued, having been revised and enlarged to conform to the development of mill construction and the experience of the insurance companies. It is sold at a nominal price in order to confine it as far as possible to those who can make use of it and will, therefore, value it. It describes and illustrates in detail the construction by which the risk of fire can be reduced to a minimum, and embodies the best practice at the present time. It should be in the possession of everyone connected with the management of mills.

Business Literature.

Water for Economical Steam Generation. By J. C. Wm. Greth.

This pamphlet, which is a reprint of an article from the Engineering Magazine, is being distributed to the trade by William B. Scaife & Sons Co., Pittsburg, Pa.

Vertical and Horizontal Engines for Fan Driving. The Massachusetts Fan Co., Watertown, Mass.

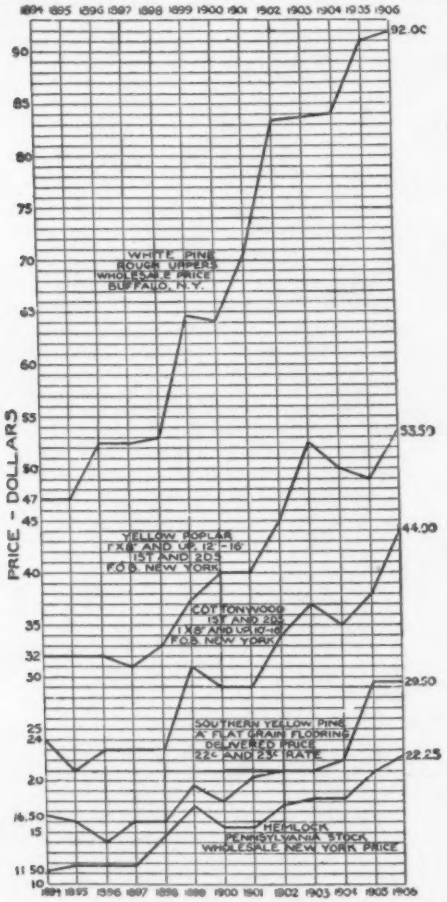
This is an additional section of a perpetual catalogue. This section, which comprises 16 pages, includes illustrations, descriptions, dimensions and horse power tables. The entire catalogue is thus brought up to a total of 116 pages of exceptionally valuable matter relating to blowers and exhausters, heating, ventilating, drying and mechanical draft apparatus, etc.

Davidson Ventilating Fans; The Massachusetts Fan Co., Watertown, Mass.

This is an attractive booklet describing the various types of Davidson fans, giving the dimensions, capacity and various connections with electric motors, and also pointing out the peculiar advantages of these fans, particularly the ball bearing feature which obviates the necessity of lubrication or other attention.

The Increase in the Cost of Lumber.

This interesting diagram taken from the 1906 Year Book of the U. S. Department of Agriculture shows the rise in prices of different kinds of lumber per thousand feet from 1894 to 1906, and the tendency has been upward since that time. Manufacturers who built ten or twelve years ago and are at a great advantage over those building new mills today in which timber enters largely into the construction in cost expense. On the other hand, the man who builds a modern mill with modern methods available for the preservation of the timber may be, at the end of twenty years, much better off than the manufacturers who built more cheaply fifteen years ago, for by using wood preservatives such as are largely used abroad where the lumber question has been a vital one for years, he may preserve the life of the timber indefinitely and by distributing its cost over a long period of years average down the price.



The Carbolineum Wood Preserving Co., 349 West Broadway, New York, have compiled some interesting information on this subject, showing the advantages to be obtained by treating lumber with preservatives, which may be had upon application.

The A. and M. College of North Carolina.

The graduating exercises of the textile department of the A. and M. College at Raleigh, N. C., were held on May 27. This department is in a very flourishing condition, showing a marked increase in the number of students and in the scope of the work covered by the various courses. At the graduating exercises the medal given to the college by the National Association of Cotton Manufacturers was presented by Maurice Hendrick of Shelby, N. C.

The Cost of Preventing Boiler Scale.

Some time since, Arthur D. Little, chemist of Boston, was called upon by one of his clients controlling a considerable number of boiler plants, to study the conditions with a view of standardizing the methods of preventing boiler scale and reducing the expense therefor. Obviously his report cannot be made public in its complete form, but, devoid of specific references, the following general abstract will doubtless prove helpful to boiler owners and operators.

In seven mills Mr. Little found soda ash and kerosene in use either alone or in combination with each other, while in three mills a sumac compound was employed. The price of the latter was 10 cents per pound, its approximate composition being

Water	28 per cent.
Insoluble Matter	9 per cent.
Sodium Carbonate	45 per cent.
Sodium Phosphate	13 per cent.
Organic Matter (Tannin)	7 per cent.

Another mill was using a special compound costing only 2 3/4 cents per pound, with an approximate composition of

Alkali	14 per cent.
Insoluble Matter	5 per cent.
Water and Organic Matter	81 per cent.

Still another mill was using a compound at 6 cents per pound composed of

Water	10 per cent.
Soda Ash	53 per cent.
Common Salt	33 per cent.
Organic Matter	4 per cent.

It was found that all the mills in the combination which used special compounds were expending nearly $1,300 per year for boiler compounds. Those which were using only soda ash and kerosene were expending very much less per horse power although practically the same water supply was provided.

The method of applying the soda ash was investigated and it was found that in the case of a number of mills there was a mistaken idea of the

use of a boiler compound. The methods employed in these mills, while differing somewhat in details, were to add the soda ash once a week and clean the boiler. The true method was shown to be to add the soda ash in small quantity and continuously, and then keep the boiler in a condition so that by frequent blowing off it is kept clean.

It was shown by Mr. Little that a considerable saving could be made and a better result secured not only by reducing the cost of the compounds themselves, but by keeping the boilers in first class condition and preventing the formation of scale, thereby reducing the amount of coal required to produce the desired amount of steam.

Impurities in the Air.

At the annual meeting of the Manchester and Salford Sanitary Association, Mr. W. Thomson gave an interesting address, in which he described a series of experiments he has made to ascertain the amount of carbonic acid gas in the air in Manchester and in various buildings under various conditions, and also on the percentage of carbonic acid gas in the exhalations of people who have breathed different kinds of air. Mr. Thomson was led to make these experiments by a request of the Association that he would bring forward some simple device for estimating the carbonic acid gas in public and other buildings. The method he recommended was that of forcing air into a bottle with an ordinary pair of bellows and submitting it to a simple chemical test.

FOUL AIR IN MANCHESTER BUILDINGS.

Mr. Thomson gave the results of the analysis of air taken in a number of schools in and near Manchester. For purposes of comparison, he took the amount of impurity that is accepted by modern architects as permissible in buildings — viz., six parts of carbon dioxide in 10,000. Samples of air taken in Macclesfield schools by Mr. Horsfall contained 1.4, 3.5, and 6.1 parts of carbon dioxide in 10,000. Air taken in some Manchester schools yielded proportions of carbonic acid gas as follows: — St. Matthew's, Deansgate (boys), 11.2; St. Stephen's, Hulme, 14.9 (girls) and 11.7 (boys); Crumpsall Lane School, 12.8 in one room and 8.3 in another; while in a school at Openshaw there was 18.2 in the boys' room and 11.5 in the girls'. In the Technical School there was 6.5. This building, Mr. Thomson said, was one of the best-ventilated in the city, but its atmosphere was objectionable to many people on account of its lack of invigorating qualities. He thought this was due to the method of washing the air which was employed.

In a Methodist Free Church near Manchester the air after service contained no fewer than 44 parts of carbonic acid gas per 10,000 volumes. Tests made in a large concert hall in Manchester showed 5.2 before a performance and 11.2 after one and a quarter hour. Tests in the Manchester Art Galleries gave 10.3 in one room and 8.6 in another. Three railway compartments yielded 12, 5.6, and 21.5. Air in a Manchester tram, 7.2. Old-fashioned houses with low ceilings in the country gave figures ranging between 5.6 and 12.5; new houses between 5.9 and 10.4, and a good-sized room that had contained four persons and three gas jets for 1 1/2 hour, 22. The carbonic acid gas in the air of one of the Manchester theatres before the performance was measured as 5.9, and after the performance, in the dress circle, 19.2.

HUMAN EXHALATIONS.

From these tests Mr. Thomson proceeded to find out the amount of carbonic acid gas exhaled in the breath of different people under different conditions. The series of experiments which he conducted might, he thought, be worth the attention of medical men and hygienists. The amount of carbonic acid in the breath was given, he said, in books on physiology as about 4 or 5 per cent. The results of his experiments showed that the amount of carbon dioxide which a man breathed out depended upon the quality of the air by which he was surrounded. In Manchester he breathed about 4 per cent., and in the country 5 per cent., so that it would appear to be necessary to take about one-fourth more food in the country than was sufficient in town. The breaths of three men were tested. In Manchester the percentage of carbonic acid gas given off by each was — A 4, B 3.8, and C 4. At the Buxton golf links, 1,000 feet above sea level, the figures were 5, 5.2, and 5.2, and after they had played eighteen holes and had lunch they each gave 4.8 per cent. They then drove to the Cat and Fiddle, 1,700 feet above the sea, and there A gave 5.2, B 5.4, and C 5.4. These results suggested that the amount of carbonic acid gas exhaled was influenced by altitude. But a test made at Blackpool did not sustain the theory. Further experiments showed that when a person went from Manchester to the country it had the effect of increasing the amount of carbonic acid exhaled to a percentage higher than that found in the case of people permanently residing in the country.

WHEN AIR IS HEATED.

He found, too, that when the air was inhaled through the mouth the breath was about .2 per cent. lower in carbon dioxide than when the nostrils alone were used. This suggested to him that if the air were artificially heated a still greater oxidization would take place in the body. Air heated to 140 centigrade was breathed, and the exhalation contained 5.4 per cent. of carbon dioxide, whereas exhalation of ordinary unheated air from the same person gave 4.4. The average in a number of experiments gave 4.1 from ordinary air and 5.2 from heated air. When pure oxygen was breathed the exhaled air gave an average of from 4.4 to 4.5, which was considerably below what one got from breathing in the country. It would appear, therefore, that country air was better for reviving people who had been asphyxiated or nearly drowned than pure oxygen, and that a maximum effect would be obtained from warmed country air and oxygen combined. It was found, however, that the hot air breathed in a Turkish bath had not the same effect as hot air breathed when the body was only at its normal heat.

DRY AND DAMP AIR.

Experiments were also made as to the effects of dry and damp air, and it was discovered that thoroughly dried air has a much more powerful oxidiz-

ing influence on the blood than air that has not been dried, and that this effect is increased by heating the air. This, Mr. Thomson suggested, was an important fact to consider when arranging the ventilation of buildings. Many people had noticed, he said, that the air of the House of Commons had a peculiarly flat taste. It was not invigorating, and the people who sat in the House suffered considerably from influenza. This was due to the fact that the air forced into the House was washed in water. If it were passed through strong vitriol or some substance that would absorb the moisture the air would be much healthier and pleasanter to breathe. These remarks applied also, he said, to the ventilation of the Manchester School of Technology.—The Manchester Guardian.

Comparative Value of Lubricating Greases.

The analyses of lubricating greases is a rather complicated procedure and one which yields little information as to whether the sample is suitable for the purpose to which it is to be applied. It is possible, however, by determinations of the water and the ash present in greases, to give important information regarding the presence of foreign materials The variation in these constituents is clearly displayed in the following table from a report by Mr. Arthur D. Little, the Boston chemist. Being of somewhat private character, designating letters have for obvious reasons been substituted for the actual names of the samples:

Designation.	Cost.	% Water.	% Ash.
A	8c.	2.48	4.56
B	11c.	7.45	0.62
C	4c.	20.50	1.92
D	7c.	4.84	5.54
E	16c.	1.53	1.53
F	1¾c.	1.18	7.68
G	5c.	2.45	2.46
H	6c.	0.72	2.20
I	6c.	1.22	3.69
J	6c.	1.04	1.65
K	5c.	1.43	4.34
L	7c.	0.96	2.73
M	15c.	2.64	2.28

These greases are on the whole of very good character, only one containing an excessive amount of water, but Mr. Little considered the prices excessive and advised that six cents per pound was as high as need be paid. He further stated that the samples were practically all of greases made with a small amount of soap as a hardener or solidifier. In some of the cases an alkali soap was used, while others contained a lime or alumina soap.

Wisconsin, Bloomer. $10,000 has been pledged for the establishment of a knitting mill. A committee of citizens is trying to induce a knit goods manufacturing company to locate a plant here which will represent an investment of about $25,000.

The Growing South.

The resistless growth of the South is one of the most impressive movements in the world today. From an essentially agricultural section, careless of economies and backward in progress, it is being transformed by the energy and self-reliant effort of its people to a manufacturing section competing on even terms with the older manufacturing states. From being merely a producer of raw materials for Massachusetts, or Pennsylvania, or foreign countries to manufacture into finished articles, turning into their pockets millions of dollars, the Southern states are now consuming growing quantities of the raw materias of their fields and forests and mines, enriching themselves enormously.

In the June issue of The World's Work, Edwin A. Alderman, President of the University of Virginia, gives a statement of the South's development. Touching the achievements in industry he says in part: "Six thousand enterprises proposing to convert such raw materials into salable products began operation in the South in 1906. Today it is using its own accumulated wealth as working capital. Its total property values in 1908 exceed those of 1860 by $6,000,000,000. In the decennial period, 1890-1900, the value of all manufactured products increased $1,250,000,000 and the estimated increase of the true values of Southern property in the past six years has been at the rate of $3,000,000 a day. On the basis of percentage of increase, the South's gain within the last six years is 48 per cent., and that of the rest of the Union 32 per cent. In other words, the old patriarchal staple states in twenty years must become the fiercest industrial region in America converting into useful articles the splendid wealth of its fields and forests and mines."

Mr. Alderman's statement gives some idea of what the South is doing. Handicapped in social and economic development by human slavery, then devastated by the Civil War, and later enduring a period of misrule in which the people were submerged in poverty and wrongs, no progress in an industrial civilization was possible. But since 1880 the South has been emerging and has transferred its energies to building and growing. Large cities have grown larger and towns have grown into manufacturing cities. South Carolina is now second only to Massachusetts in the number of cotton spindles operated, and North Carolina closely follows her sister state. In other industries similar advances have been made.

Even if the past phenomenally high percentage of increase in the South's invested capital and number of manufacturing enterprises is not maintained or increased in the next decade, it can hardly fall below the average for the rest of the Union, which means a widening and increasing market for its iron and cotton and coal, adding billions of dollars to its wealth. As the market for raw materials grows the South shows her ability to keep up with the demand. "When the world can use a 25,000,000-bale crop of cotton, the South will supply it," is a trite and undoubtedly a true claim, and is illustrative of the undeveloped resources of the country.

That the coal fields in the Eastern counties of Tennessee are the equal of any in the world is a fact which most of us have not known, so accus-

tomed are we to think of Pennsylvania as the producer of coal and the Southern States as the producers of cotton and tobacco. Outcroppings are to be seen on the mountain sides and a heavy blow will dislodge enough coal to run a furnace for days. The United States Steel Corporation has secured control of a large area of these coal fields and recently added additional area to their holdings. It is strange that these coal fields have escaped so long. Mines are being worked which are capable of supplying all the fuel the growing South can use. Writing of these coal mines in the Buffalo Evening News, John D. Wells records the wealth of coal as he found it on a visit to that section. He writes: "Even more valuable than its timber is the coal in the Cumberlands. It runs in veins from seven to fifteen feet thick under many of the mountains that go to make the range. It is not anthracite nor is it bituminous, but a cross between the two that makes the best steam coal available and seems to be practically endless in quantity." The Battle Creek seam where it is being worked by the Cross Creek Coal Company shows remarkable thickness of solid block coal.

With the wealth of resources waiting to be developed, with an energetic, progressive people striving after progress, and with a rapidly increasing population through immigration, it will indeed be strange if the South of tomorrow does not go on growing as fast as the South of today.

Textile Chemistry.

The course of lectures instituted this spring at the Association Hall, Kensington, Philadelphia, has proved to be so successful that a more extended series has been arranged for this fall. Mr. Ira D. Shaw, who has charge of the educational work at this institution, has endeavored by means of these lectures to interest those who are occupied in the mills during the day hours. If this attempt to establish in Philadelphia a local center for lectures in textile chemistry is successful, as now seems probable, it will be made a fixture. The course was conducted by Dr. Frederic Danforth of that city.

Chicago Dye Works Enlarging.

The Western Thread & Dye Works of Chicago are enlarging their plant at 21st St. and Marshall Boulevard and within the last few days have awarded contracts for machinery which will largely increase the capacity of the bleaching department. This step has been made necessary by the company's growing volume of business, due to some extent, no doubt, to saving of time and freight for customers, but to a larger extent to the high class work done by this concern. Ever since the starting of the industry, the Western Thread & Dye Works have met with signal success. They do cotton and mercerized dyeing and bleaching, also cone and tube winding.

Indianapolis Branch.

The H. W. Johns-Manville Co., of New York, announce the opening of a branch office in Indianapolis, Ind., to take care of the local requirements of the trade in that territory.

This office, which is located at 30 South Pennsylvania St., Indianapolis, will be under the management of Mr. Charles E. Wehr, who, for several years, has represented the company in that section.

The Berry Engineering Company of Chester, Pa., have just issued a new catalogue describing their safety feed water regulator, and other steam specialties.

The Massachusetts Fan Co., Watertown, Mass., is making a large export shipment of fans to the Sutcliffe Ventilating & Drying Co., Manchester, England. This comprises six 3/4-housed steel plate fans in various sizes equipped with new frictionless ball bearings.

Davidson ventilating fans, manufactured by the Massachusetts Fan Co., Watertown, Mass., are being installed by M. J. Whittall, Worcester, Mass.; French Benzol Dry Cleaning Co., Cincinnati, O., and by the Glenlyon Dye Works, Saylesville, R. I., to whom six special fans are being furnished.

Lectures on Heating and Ventilation.

Mr. J. R. McColl, formerly associate professor of steam engineering at Purdue University, Lafayette, Ind., and now connected with the engineering department of the American Blower Company, Detroit, has been delivering a series of lectures before engineering classes of the technical schools in the Middle West. The subjects dealt with are the movement and heating of air for heating, ventilating and drying systems, the theory and practice of blower design and installation, and kindred topics.

The lectures are illustrated by means of stereopticon views and are followed by animated discussions on the part of the students, who invariably evince great interest in the subjects presented.

Potato Starch.

Thos. Leyland & Co., 60 India St., Boston, Mass., have recently taken the agency for pure Western potato starch, and are quoting attractive prices, with guarantee of purity.

Three months ago the Spreckel Sugar Refining Co. of Philadelphia put in one of the Berry feed water regulators in competition of three other makes. Last week they got the order for sixteen, as a result of these tests. The New England Agency has recently placed one with the Quincy Cold Storage and Warehouse Co., and second orders have been received from a number of improved manufacturing plants. The sales force of this company feels much encouraged at the outlook.

Recent Textile Patents.

BOBBIN FRAME. 891,185. Howard McDowell, Philadelphia, Pa.

HAIRCLOTH FABRIC. 890,611. George S. Cox, Fitzwatertown, Pa., assignor to himself and Walter S. Cox, Philadelphia, Pa.

KNITTING MACHINE Attachment. Warp. 891,217. Edgar W. Heath, Chicago, Ill.

KNITTING MACHINES. Pattern Device for Warp. 891,216. Edgar W. Heath, Chicago, Ill.

KNITTING MACHINE Stop Motion. Automatic. 890,038. Richard Filtz and Alfred Lake, Kingston, Ontario, Canada.

LOOM Harness-Motion Device. 889,971. Levi E. Salisbury, Providence, R. I.

LOOM. Narrow-ware. 890,320. Adolph Widmer and Samuel Widmer, Paterson, N. J.

LOOM for Weaving Tubular Fabrics. 890,761. Clare H. Draper, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM for Weaving Tufted Fabrics. 891,147. Thomas Cooper, Kidderminster, England.

LOOM. Haircloth. 890,612. George S. Cox, Fitzwatertown, Pa.

LOOM. Kindergarten. 890,733. Jessie C. Tyndall, St. Louis, Mo.

LOOM Thread Cutting Temple. 890,884. Edward S. Stimpson, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

LOOMS. Bobbin Stripper for Weft Replenishing. 890,865. Frederic W. Moore, Millbury, Mass., assignor to Draper Co., Hopedale, Mass.

LOOMS. Filling Exhaustion Indicating Mechanism for. 890,749. Franklin Allen, Waltham, Mass., assignor to Draper Co., Hopedale, Mass.

MEASURING MACHINE. Cloth. 891,075. Asa C. Jackson, New Market, Ia.

ROTATABLE Spindle and Bobbin. 890,881. Charles A. Smith, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

SPINDLE and Twisting Device. Yarn. 890,618. Desire Despradelle, Boston, Mass.

SPINNING-FRAME Roller. 890,060. Sumter D. Hammett, Arlington, S. C.

STOCKING-TURNING Machine. 890,833. William J. Anderson, Philadelphia, Pa.

WARP-STOP Motion Detector. 890,738. John P. Webber, Lawrence, Mass., assignor to Draper Co., Hopedale, Mass.

Textile Trade Marks Registered.

"Eagle Brand." Overalls and Overall Coats. The L. A. Palmer Co., Inc., Abingdon, Va.

"Marguerite." Ladies' and Misses' Shirt Waists. The Morgan-Anderson Co., Toledo, O.

"Theodora." Cloth Dress Goods. Theodor Salfner, New York.

"El Dorado." Cotton Piece Goods. Murphy, Grant & Co., San Francisco, Cal.

"Amsterdam." Knit Silk and Cotton Gloves. Julius Kayser & Co., New York.

"Irontex." Hosiery. R. H. Macy & Co., New York.

"Nihon." Knitted Underwear and Hosiery. Chas. Simon's Sons, New York.

"Reyemdale." Cotton Piece Goods. John H. Meyer, New York.

"Lusitania." Ribbons. L. & E. Stirn, New York.

"U. S. School Girl." Hosiery. Davis Hosiery Mills, Chattanooga, Tenn.

"Dreadnaught." Silk Piece Goods. Carson Pirie Scott & Co., Chicago, Ill.

"Merrow Widow." Ruffles and Shirt-waist Extenders. Grommet Mfg. Co., New York.

"R. N. O." A Waterproofing Dressing for Leather, Textiles and Other Fabrics. Water Resistant Co., London, England.

"Patrine." Hat Ribbons. German Artistic Weaving Co., New York.

"Tortum." Woolen and Worsted Woven Piece Goods. John S. Ainley, Huddersfield, England.

"Trident." Cotton Thread and Yarn. The Spool Cotton Co., Newark, N. J.

"Priestleys Varnished Board." Worsted, Woolen and Silk Piece Goods and Dress Goods. Priestleys Limited, Bradford, England.

"Greenfield Bleaching and Finishing." Ribbons. John V. Farwell Co., Chicago, Ill.

"Orchid." Cotton Textile Fabrics. Coventry Co., Providence, R. I.

"Cattle." Cotton Textile Fabrics. Coventry Co., Providence, R. I.

"Farmers Choise." Cotton Textile Fabris. Coventry Co., Providence, R. I.

"Character Clothes." Women's, Misses' and Children"s Suits and Coats. L. Jacobson's Sons, New York.

"Alsa." Cotton, Linen, Silk, Wool, Etc., Thread. Dollfus-Mieg & Co., Mulhouse, Germany.

"W." Woolen Shirts, Coats, Etc. J. H. Rice & Friedmann, Milwaukee, Wis.

"Samsonedge." Ribbons and Handkerchiefs. International Ribbon Works, New York.

"Elite." Men's and Ladies' Gloves. Elite Glove Co., Gloversville, N. Y.

"Pearl." Knitted Waists. John F. Quinn, Cohoes, N. Y.

"Dead Shot." Cotton Piece Goods. Grinnell Willis & Co., New York.

"Santa Claus." Cotton Piece Goods. Grinnell Willis & Co., New York.

"Wayside." Cotton Piece Goods. Grinnell Willis & Co., New York.

"Old Folks." Cotton Piece Goods. Grinnell Willis & Co., New York.

"Bluebell." Lawns. Strawbridge & Clothier, Philadelphia, Pa.

"Italian." Knit Silk Underwear. Julius Kayser & Co., New York.

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DIRECT IMPORTERS OF EGYPTIAN COTTON

COTTON WOOLEN WORSTED MACHINERY

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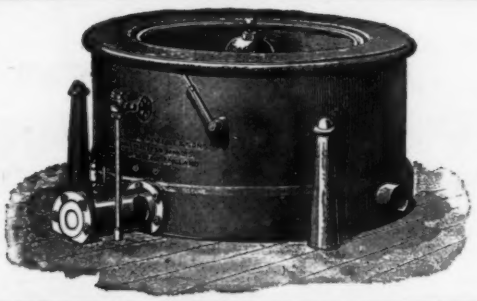
Huddersfield, Eng.

PATENT DIRECT STEAM DRIVEN

HYDRO-EXTRACTORS

OVER 3500 IN USE. ALSO ELECTRICALLY DRIVEN



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Friction Load

You know the friction load of a mill, the power to turn belts and shafting alone, is high, from 20-50 per cent. of your total load.

Half of this is from tight belts.

Cling-Surface permits every belt to be run easy and carry fullest loads and turns this half from overcoming friction to doing work.

Besides preserving the belts, saving oil, labor and fuel, and giving steady, even speed at machines.

It is a belt food — not a sticky dressing.

A trial order will prove it. Send for one.

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D and M PRODUCTS

eliminate bleaching, tinting, softening and finishing troubles

We have studied the requirements of Hosiery and underwear finishing fully and know by the results representative mills are getting with

D=M Bleaching Assistant

D=M Bleacher's Blue **D=M Egyptian Tint**

D=M Softener **D=M Gum for Hosiery** **D=M Woolclean**

that we can help **you**

DANKER & MARSTON, BOSTON

Buyers' Index

The addresses of builders of mill machinery and dealers in mill supplies, whose names appear in the following classified index, may be found upon referring to their advertisements. The Alphabetical Index to advertisers follows this classified list. Buyers who are unable to find in the classification here given such machinery or supplies as they desire, are invited to communicate with the publishers, who can, in all probability, refer them to proper sources. Advertisers whose names do not appear under desired headings will please notify the publishers. Such omissions are accidental, not intentional.

Air Moistening System.
American Moistening Co.
Buffalo Forge Co.

Architects and Mill Engineers.
Ferguson, John W.

Asphalt Floors.
Simpson Bros. Corporation.

Asphalt Tanks.
Scaife, W. B., & Sons.

Automatic Feeds for Cotton and Wool.
American Drying Machinery Co.
Kitson Machine Co.
Leigh, Evan A.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Schofield, Wm., Co.
Woonsocket Machine & Press Co.

Automatic Warp Drawing Machines.
American Warp Drawing Machine Co.

Bale Ties.
Acme Steel Goods Co.
DeHaven Manufacturing Co.

Baling Presses.
Philadelphia Drying Mchy. Co.
Minnich Machine Works.
Sullivan Machinery Co.

Bandings.
——See under Yarns.

Baskets.
Crane Brothers.
Lane, W. T., & Bro.

Bearing Metals.
Dodge Mfg. Co.

Belting.
Burnham, E. E., Co.
Gandy Belting Co.
Rhoads, J. E., & Sons.
Shultz Belting Co.
——See also Mill Supplies.

Belt Dressing.
Cling Surface Mfg. Co.
Dixon, Jas., Crucible Co.
Shultz Belting Co.
Stephenson Mfg. Co.

Belt Lacing Machines.
Birdsboro Steel Foundry & Machine Co.

Bias Machines.
Adams, A. L.

Bindings.
——See Tapes and Braids.

Bleaching Kiers.
Arlington Mch. Wks. (Arthur Birch, prop.)
Philadelphia Drying Machinery Co.
Textile Finishing Machinery Co.

Bleaching Materials.
Bosson & Lane.
Danker & Marston.
Roessler & Hasslacher Chemical Co.

Blowers and Blower Systems.
American Blower Co.
Buffalo Forge Co.
Dean Bros. Steam Pump Works.
Mass. Fan Co.
Philadelphia Drying Machinery Co.
Sturtevant, B. F., Co.
Schnitzler, Chas. H.

Bobbins, Spools, Shuttles, Etc.
American Supply Co.
American Textile Specialty Mchy. Co.
Leigh, Evan A.
Lestershire Spool & Bobbin Co.
Tebbets, E. L., & Co.
Wilson & Co.

Bobbin Winders.
Universal Winding Co.

Boiler Inspection and Insurance.
——See Steam Boiler Insurance.

Boilers.
——See Steam Boilers.

Boxes, Cloth Boards, Etc.
Pearson, J. T.

Box Strapping.
Acme Steel Goods Co.
De Haven Mfg. Co.

Braiding Machinery.
New England Butt Co.
Textile Machine Works.

Braids.
——See Tapes, Braids and Edgings.

Brass Hinges.
Root, C. J., Co.

Brazing.
American Ferrofix Brazing Co.

Bridges.
Scaife, W. B., & Sons.

Brushers.
——See Napping Machines.

Brushes.
Felton, S. A., & Son Co.
Mason Brush Works.

Burr Pickers.
Curtis & Marble Machine Co.
Sargent's, C. G., Sons.
Smith & Furbush Machine Co.

Calico Printers' Machinery and Supplies.
Arlington Mch. Wks. (Arthur Birch, prop.)
Birch Bros., Somerville Machine Wks.
Butterworth, H. W., & Sons Co.
Taunton-New Bedford Copper Co.
Textile Finishing Mchy. Co.
——See also Dyeing, Bleaching, Machinery, etc.

Canvas Baskets.
Lane, W. T., & Bro.

Caps.
Calder Machine Works.

Carbonizing Machinery.
Birch Bros., Somerville Machine Wks.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Sargent's, C. G., Sons.
Tolhurst Machine Works.

Card Clothing.
Ashworth Bros.
Leigh, Evan A.
Riley, C. E., Company.
Stoddard, Haserick, Richards & Co.

Card Cutting.
Vial, Pierre.

Carded Cotton.
Blaisdell, S., Jr., Company.

Card Feeds.
——See Automatic Feeds.

Card Grinding Machinery.
Entwistle, T. C., Co.
Leigh, Evan A.
Riley, C. E., Company.
Smith & Furbush Machine Co.
Stoddard, Haserick, Richards & Co.

Carders' Tools.
Brown, Wm. H., Co.

Carpet Machinery.
Altemus, Jacob K.
Curtis & Marble Machine Co.
Philadelphia Textile Machinery Co.
Smith & Furbush Machine Co.

Casting Repairs.
American Ferrofix Brazing Co.

Castings.
Farrel Foundry and Machine Co.
Schofield, Wm., Co.

Cell Driers.
Cell Drier Machine Co.

Cement Pans.
Scaife, W. B., & Sons.

Chemicals.
Harding & Fancourt.
Roessler & Hasslacher Chemical Co.
Vera Chemical Co.

Chemists.
Little, Arthur D.

Cling Surface.
Cling Surface Mfg. Co.

Clocks.
Pettes & Randall Co.

Cloth Boards.
Chaffee Bros.
Frontier Supply Co.
Pearson, J. T.
Richardson Brothers.

Cloth Cutting Machinery.
Cameron Machine Co.

Cloth Stretchers.
Arlington Mch. Wks. (Arthur Birch, prop.)
Leyland, Thomas, & Co.
Textile Finishing Machinery Co.

Clutches.
American Tool & Machine Co.
Dodge Mfg. Co.
Hunter, James, Machine Co.

Combs (Wool and Cotton).
Hood, R. H.
Jefferson, Edward & Brother.
Leigh, Evan A.
Philadelphia Textile Machinery Co.
Riley, C. E., Company.
Stewart & Sons.
Stoddard, Haserick, Richards & Co.

Concrete Work and Construction.
Gilbreth, Frank B.

Condensers.
Dean Bros. Steam Pump Works.

Conditioning of Textile Fabrics.
New York Silk Conditioning Works.

Consulting Electrical Engineer.
Puffer, William L.

Conveying Systems.
Buffalo Forge Co.
Dodge Mfg. Co.
Sturtevant, B. F., Co.

Cop Spindles.
American Textile Specialty Mchy. Co.

Cop Tubes.
American Textile Specialty Mchy. Co.
——See Paper Tubes.

Copper Print Rollers.
Taunton-New Bedford Copper Co.

Coppersmiths.
Badger, E. B., & Sons Co.

Copper Work for Dyers.
Butterworth, H. W., & Sons Co.
Textile Finishing Machinery Co.

Cork Inserts.
National Brake & Clutch Co.

Corrugated Iron and Steel.
Scaife, W. B., & Sons.

Cost and Accounting Systems.
Wright, R. A.

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Cotton.
Blaisdell, S., Jr., Co.
Charles, W. B.
Riley, C. E., Company.
Schwartz, L. H. A., & Co.
Stoddard, Haserick, Richards Co.
Tolar & Hart.

Cotton Machinery.
Altemus, Jacob K.
American Textile Appliances Co.
American Textile Specialty Mchy. Co.
Ashworth Bros.
Brockway & Meckenstrum.
Butterworth, H. W., & Sons Co.
Cramer, Stuart W.
Crompton & Knowles Loom Works.
Curtis & Marble Machine Co.
Draper Company.
Easton-Burnham Co.
Elliott & Hall.
Entwistle, T. C., Co.
Firth, William, Co.
Howard & Bullough American Mach. Co.
Kilburn, Lincoln & Co.
Kip-Armstrong Co.
Kitson Machine Co.
Leigh, Evan A.
Lowell Machine Shop.
Mason Machine Works.
McKerrow, H. G., Co., Ltd.
Metallic Drawing Roll Co., The.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Providence Machine Co.
Riley, C. E., Company.
Saco & Pettee Machine Shops.
Schofield, Geo. L.
Schwartz, L. H. A., & Co.
Smith & Furbush Machine Co.
Stafford, G. W., Mfg. Co.
Stoddard, Haserick, Richards & Co.
Textile Finishing Machinery Co.
Textile Machinery Co.
Whitin Machine Works.
Woonsocket Machine & Press Co.

Cotton Openers and Lappers.
Howard & Bullough American Mach. Co.
Kitson Machine Co.
Leigh, Evan A.
Riley, C. E., Company.
Stoddard, Haserick, Richards & Co.

Cotton Softeners.
Bosson & Lane.
Burckhardt & Co.
Danker & Marston.
Harding & Fancourt.
Nicetown Mfg. Co.

Cotton Waste.
Blaisdell, S., Jr., Co.
Charles, W. B.
Schofield, Edwin F.

Counting Machines.
Root, C. J., & Co.

Crayons.
Dixon, Jos., Crucible Co.
Howe Mill Crayon Co.
Lowell Crayon Co.

Cutting Machines.
Cameron Machine Co.

Cylinder Oil (Superheated Steam).
Power Specialty Co.

Dextrine.
Stein, Hirsh & Co.

Dobbies.
Crompton & Knowles Loom Works.
Kilburn, Lincoln & Co.
Stafford, G. W., Mfg. Co.

Dobby Chain.
Nuttall, George.

Draughtsmen.
Cameron Machine Co.

Drawing Rolls.
Hood, R. H.
Jefferson, Edward & Brother.
Metallic Drawing Roll Co., The.

Drying Machinery.
American Blower Co.
Arlington Mch. Wks. (Arthur Birch, prop.)
Birch, Arthur, Arlington Mch. Wks.
Birch Bros., Somerville Machine Wks.
Buffalo Forge Co.
Butterworth, H. W., & Sons Co.
Cell Drier Machine Co.
Hunter, Jas., Machine Co.
Jefferson, Edward & Brother.
Kenyon, D. R., & Son.
Mass. Fan Co.
Philadelphia Drying Machinery Co.
Sargent's, C. G., Sons.
Schwartz, L. H. A., & Co.
Sturtevant, B. F., Co.
Textile Finishing Machinery Co.
Tolhurst Machine Works.

Drying Boards.
Bull, William C.
Pearson, J. T.
Philadelphia Drying Mchy. Co.

Dusters.
——See Wool and Waste Dusters.

Dust Collectors.
Philadelphia Drying Machinery Co.
Sturtevant, B. F., Co.

Dyers, Bleachers and Finishers.
Brophy's, T., Sons.
Davidson, J. F.
Davis & Quick.
Firth & Foster Co.
Globe Dye Works Co.
Home Bleach & Dye Works.
Lorimer's, The Wm. H., & Sons Co.
Pawtucket Dyeing & Bleaching Co.
Peerless Co.
Rowland, Samuel.
Solway Dyeing & Textile Co.
Utica Willowvale Bleaching Co.
Western Thread & Dye Works.

Dyeing, Drying, Bleaching and Finishing Machinery.
Allen, William, Sons Co.
American Blower Co.
Arlington Mch. Wks. (Arthur Birch, prop.)
Birch, Arthur, Arlington Mch. Wks.
Birch Bros., Somerville Machine Wks.
Buffalo Forge Co.
Butterworth, H. W., & Sons Co.
Cell Drier Machine Co.
Curtis & Marble Machine Co.
Entwistle, T. C., Co.
Gessner, David.
Heathcote, John, & Son.
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Hunter, James, Machine Co.
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Klauder-Weldon Dyeing Machine Co.
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Leyland, Thos., & Co.
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Philadelphia Textile Machinery Co.
Schwartz, L. H. A., & Co.
Smith, Drum & Co.
Sturtevant, B. F., Co. (Drying).
Textile Finishing Machinery Co.
Tolhurst Machine Works.
Vacuum Dyeing Machine Co.

Dye House Cans.
Hill, James, Mfg. Co.

Dye House Floors.
Simpson Bros. Corporation.

Dye House Trucks.
Bailey, Frank.

Dye Sticks.
Bailey, Frank.
Haedrich, E. M.

Dye Tubs.
——See Tanks, Tubs and Vats.

Dyestuffs and Chemicals.
American Dyewood Co.
Atteaux, F. E., & Co.
Badische Co.
Berlin Aniline Works.
Bischoff & Co.
Bosson & Lane.
Cassella Color Co.
Chemische Aniline Works.
Danker & Marston.
Kalle & Co.
Ford, J. B., Co.
Geisenheimer & Co.
Johnson, Chas. A., & Co.
Klipstein, A., & Co.
Leyland, Thos., & Co.
Metz, H. A., & Co.
Roessler & Hasslacher Chemical Co.
Sykes, Walter F., & Co.
Thayer, Ed. M., & Co.

Dynamos.
——See Electric Lighting.

Edgings.
——See Tapes, Braids and Edgings.

Electrical Construction.
Crocker-Wheeler Co.
General Electric Co.
Sturtevant, B. F., Company.
Westinghouse Electric & Mfg. Co.

Electrical Engineer (Consulting.)
Puffer, William L.

Electrical Heating Devices.
Crocker-Wheeler Co.

Electrical Supplies.
Pettingell-Andrews Co.

Electric Driven Pumps.
Dean Bros. Steam Pump Works.

Electric Fans.
American Blower Co.
Buffalo Forge Co.
Crocker-Wheeler Co.
General Electric Co.
Mass. Fan Co.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Sturtevant, B. F., Co.
Westinghouse Electric & Mfg. Co.

Electric Hoists.
Crocker-Wheeler Co.

Electric Lamps.
Pettingell-Andrews Co.

Electric Lighting.
Buffalo Forge Co.
Crocker-Wheeler Co.
General Electric Co.
Sturtevant, B. F., Co.
Westinghouse Electric & Mfg. Co.

Electric Motors.
——See Motors (Electric).

Elevators.
Salem Elevator Works.

Embossing Machines.
Cameron Machine Co.

Employees' Time Recorders.
Pettes & Randall Co.

Engine Repairs.
Fishkill Landing Machine Co.

Exhaust Heads.
Buffalo Forge Co.
Sturtevant, B. F., Co.

Expansion Joints.
Power Specialty Co.

Factories (For Sale and To Lease).
Moore, J. Clifford, & Co.

Fans—Exhaust and Ventilating.
——See Ventilating Apparatus.

Feed Water Heaters.
Scaife, W. B., & Sons.

Feed Water Pumps.
Dean Bros. Steam Pump Works.
Goulds Mfg. Co.

Feed Water Purifiers.
Dodge Mfg. Co.
Scaife, W. B., & Sons.

Feeds.
——See Automatic Feeds.

Feed Water Regulators.
Berry Engineering Co.

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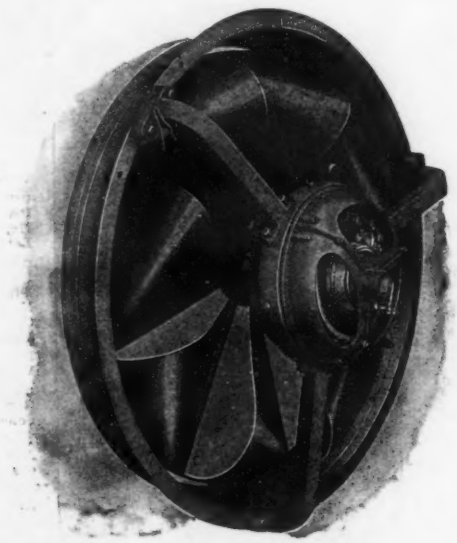
For Summer Ventilation

Use a Sturtevant Electric Fan.

Built in full line of sizes from 18" to 120" with capacities of 2,000 to 175,000 cubic feet per minute. Motors entirely enclosed. Also built as pulley fans in same sizes. Immediate shipment can be made from works or branch houses. Send for Bulletins Nos. 146 and 149.



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General Office and Works, Hyde Park, Mass.

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Designers and Builders of Heating, Ventilating, Drying and Mechanical Draft Apparatus; Fan Blowers and Exhausters; Rotary Blowers and Exhausters; Steam Engines, Electric Motors and Generating Sets; Pneumatic Separators, Fuel Economizers, Forges, Exhaust Heads, Steam Traps, Steam Turbines, etc. 624

Felt Hardeners.
Farrel Foundry and Machine Co.

Felting Machinery.
Farrel Foundry and Machine Co.

Filters.
Hungerford & Terry.
Norwood Engineering Co.
Scaife, W. B., & Sons.

Finishing Machinery.
—See Dyeing, Drying, Bleaching and Finishing.

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Borgner, Cyrus, Co.

Fire Extinguishers.
Badger, E. B., & Sons Co.

Fire Hose.
Eureka Fire Hose Co.

Fire Hydrants.
Norwood Engineering Co.

Fire Insurance.
Home Insurance Co.

Fire Proof Doors and Windows.
Badger, E. B., & Sons Co.

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Fairbairn-Lawson-Combes-Barbour, Ltd.

Fluted Rolls.
Hood, R. H.
Leigh, Evan A.
Jefferson, Edward & Brother.
Riley, C. E., Company.
Thurston, A. G., & Son.

Flyers.
Bodden, Wm., & Son, Ltd.
Calder Machine Works.
Hopkins Machine Works.
Jefferson, Edward & Brother.
Leigh, Evan A.
Textile Machinery Co.

Fly Wheels.
Dodge Mfg. Co.

Forges.
Sturtevant, B. F., Co.

Friction Clutches.
—See Clutches.

Friction Cones.
Evans, G. Frank.

Friction Rings (Cork Insert).
National Brake & Clutch Co.

Fuel Economizers.
Buffalo Forge Co.
Sturtevant, B. F., Co.

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Hopkins Machine Works.
Hunter, Jas., Machine Co.
Kenyon, D. R., & Son.

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Murphy Iron Works.

Garnetts.
Leigh, Evan A.
Smith & Furbush Machine Co.

Gas Blowers and Exhausters.
Sturtevant, B. F., Co.

Gas Engines.
Jones, Lewis.
Olney & Warrin.

Gaskets (Superheated Steam).
Power Specialty Co.

Gassing Machines.
Stubbs, Joseph.

Gauges.
Crosby Steam Gage & Valve Co.
Walworth Manufacturing Co.

Gears.
Dodge Mfg. Co.
Farrel Foundry and Machine Co.
New Process Raw Hide Co.

Gear Cutting.
Farrel Foundry and Machine Co.

Gear Cutting Machine.
Whiton, The D. E., Co.

Generating Sets.
Buffalo Forge Co.
Crocker-Wheeler Co.
Sturtevant, B. F., Co.

Geyser Water Heater.
Sargent's Sons, C. G., Corp.

Greases.
N. Y. & N. J. Lubricant Co.

Heating.
—See Ventilating Apparatus.

Heddles.
Stoddard, Haserick, Richards & Co.

Hoisting Apparatus.
Economy Engineering Co.

Hosiery Boards.
Pearson, J. T.
Philadelphia Drying Machinery Co.

Hosiery Labels.
Kaumagraph Company.

Humidifying Apparatus.
American Moistening Co.
Buffalo Forge Co.
Cramer, Stuart W.
Parks, G. M., Co.

Hydraulic Rams.
Power Specialty Co.
Walworth Mfg. Co.

Hydro Extractors.
American Tool & Machine Co.
Broadbent, Thomas, & Sons.
Riley, C. E., Company.
Stoddard, Haserick, Richards & Co.
Textile Finishing Machinery Co.
Tolhurst Machine Works.

Illuminating Engineer.
Puffer, William L.

Insulating and Braiding Silks.
Sauquoit Silk Mfg. Co.

Insurance (Casualty, Fire and for Loss of Profits.)
Home Insurance Co.

Investments.
Cross Creek Coal Co.

Ironing Machines for Knit Goods.
Consolidated H. S. & L. M. Company.

Jacquards.
Halton's, Thomas, Sons.

Knit Goods, Edgings, Trimmings, Etc.
Chapin, Geo. W.
Charles, W. B.
Cheney Bros.
Friedberger-Aaron Mfg. Co.
Krout & Fite Mfg. Co.
Weimar Bros.

Knit Goods, Finishing Machines Crochet, Etc.
Consolidated H. S. & L. M. Company.
Merrow Machine Co., The.
Nye & Tredick Co.
Robinhold Machine Co.
Scott & Williams.
Union Special Machine Co.
Willcox & Gibbs Sewing Machine Co.

Knitting Machine Cylinders.
Paxton & O'Neill.
Stafford & Holt.

Knitting Machinery.
Boss Knitting Machine Co.
Brinton, H., & Co.
Claes & Flentje.
Cooper, Chas.
Crane Mfg. Co.
Crescent Machine Co.
Dubied, Edouard, & Co.
Excelsior Knitting Machine Mfg. Co.
Gormly, Robt. W., & Co.
Grosser Knitting Machine Co.
Hemphill Mfg. Co.
Jenckes, E., Mfg. Co.
Jones, Lewis.
Lamb Knitting Mach. Mfg. Co.
Leighton Machine Co.
Mayo, Geo. D., Knitting Machine Co.
Mayo Knitting Machine & Needle Co.
National Automatic Knitter Co.
Nye & Tredick Co.
Paxton & O'Neill.
Ruth Machine Co.
Scott & Williams.
Stafford & Holt.
Standard Machine Co.
Taylor, James.
Tompkins Bros. Co.
Walther, Otto.
Wildman Mfg. Co.

Knitting Needles and Supplies.
Breedon's, Wm., Son.
Brinton, H., & Co.
Continental Latch Needle Company.
Cooper, Chas.
Corey, Wm., Co.
Crane Mfg. Co.
Dodge Needle Co.
Excelsior Needle Co.
Grosser Knitting Machine Co.
Ives, L. T., Co.
Lamb Knitting Machine Mfg. Co.
Keystone Latch Needle Co.
Mayo Knitting Machine & Needle Co.
Page Needle Co.
Ruth Machine Co.
Wardwell Needle Co.

Lamps, Incandescent.
General Electric Co.
Westinghouse Electric & Mfg. Co.

Loom Pickers.
Barlow, John W., Co.
Garland Mfg. Co.

Looms.
Crompton & Knowles Loom Works.
Draper Company.
Kilburn, Lincoln & Co.
Leigh, Evan A.
Lowell Machine Shop.
Mason Machine Works.
Stafford, Geo. W., Co.
Stoddard, Haserick, Richards & Co.
Whitin Machine Works.

Loopers.
Beattie Machine Works.
Hepworth, John W., & Co.
Leighton Machine Co.

Lubricants.
Borne, Scrymser Co.
Dixon, Jos., Crucible Co.
N. Y. & N. J. Lubricant Co.
Olney & Warrin.

Lubricators.
Detroit Lubricator Co.
Walworth Mfg. Co.

Lumpers.
Gerry, George, & Son.
Schofield, Wm., Co.

Machine Designers.
Adams, A. L.
Cameron Machine Co.

Machine Tools.
Am. Tool Works Co.

Machinery Dealers.
Jefferson, Ed., & Bro.
Lamb, J. K., Textile Mach. Co.
Schofield, Geo. L.
Taylor, James.

Machinists.
Adams, A. L.
Calder Machine Works.
Cameron Machine Co.

Machinists' Tools.
Whiton, The D. E., Co.

Mails.
Walder, J.

Marking Pots.
Bradley, A. J.

Measuring and Folding Machines.
Adams, A. L.
Curtis & Marble Machine Co.
Elliott & Hall.
Root, C. J., Co.

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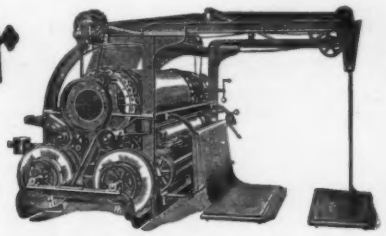
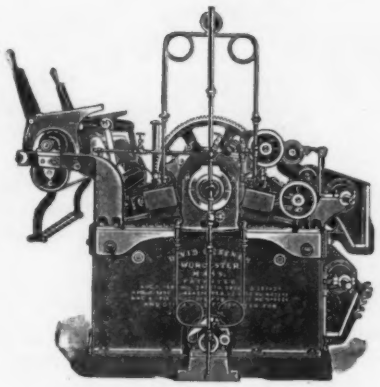
David Gessner

Worcester, Mass.





Latest Improved Cloth Finishing Machinery

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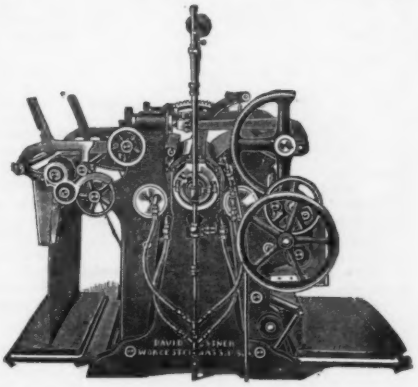
Napping Machines and Presses a Specialty



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New INVENTIONS in Mechanical Textile Devices Developed and Exploited.

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Buffalo Forge Co.
Massachusetts Fan Co.

Mechanical Draughtsmen.
Sturtevant, B. F., Co.
Cameron Machine Co.

Mechanical Engineers.
American Blower Co.
Buffalo Forge Co.
Dodge Mfg. Co.
Gilbreth, Frank B.
Philadelphia Drying Machinery Co.
Sturtevant, B. F., Co.

Mechanical Stokers.
Murphy Iron Works.

Mercerizers.
Globe Dye Works Co.
Home Bleach & Dye Works.
Lorimer, Wm. H., Sons Co.

Mercerizing Machinery.
Buhlmann, A. W.
Butterworth, H. W., & Sons.
Klauder-Weldon Dyeing Machine Co.
Schwartz, L. H. A., & Co.
Smith, Drum & Co.
Textile Finishing Machinery Co.

Metallic Fire-proof Window Frames and Sashes.
Badger, E. B., & Sons Co.

Metallic Packing.
Power Specialty Co.

Mill Architects.
——See Architects and Mill Engineers.

Mill Builders and Engineers.
Ferguson, John W.

Mill Supplies.
American Supply Co.
Bamford & Smith.
Buckley's, Benjamin, Sons.
Burnham, E. E., & Co.
Crosby Steam Gage and Valve Co.
Easton-Burnham Co.
Eureka Fire Hose Co.
Garland Mfg. Co.
Jefferson, Ed., & Bro.
Lane, W. T., & Bro.
Leigh, Evan A.
Murphy, E. W., & Co.
N. Y. & N. J. Lubricant Co.
Olney & Warrin.
Philadelphia Drying Machinery Co.
Pratt, R. C.
Riley, C. E., Company.
Richardson Bros.
Shaw, Victor, Ring Traveler Co.
Stephenson Mfg. Co.
Stoddard, Haserick, Richards & Co.
Thurston, A. G., & Son.
Vandegrift, Elias T.
Walworth Manufacturing Co.

Motors (Electric).
Buffalo Forge Co.
Crocker-Wheeler Co.
General Electric Co.
Sturtevant, B. F., Co.
Westinghouse Electric & Mfg. Co.

Napping Machinery.
Birch Bros., Somerville Machine Wks.
Curtis & Marble Machine Co.
Gessner, David.
Jones, Lewis.
Leigh, Evan A.

Noils (Silk).
Malcolm Mills Co.
Ryle, Wm., & Co.

Non-Fluid Oils.
N. Y. & N. J. Lubricant Co.

Oil Cups.
Walworth Manufacturing Co.

Oils.
Borne, Scrymser Co.
Eurckhardt & Co.
Harding & Fancourt.
Murphy, E. W., & Co.
New York & New Jersey Lubricant Co.
Stephenson Mfg. Co.
Vera Chemical Co.

Oil Stencil and Press Board Paper.
Bradley, A. J.

Overseaming Machines.
Merrow Machine Co.
Willcox & Gibbs Sewing Machine Co.

Packings (Metallic).
Power Specialty Co.

Paints (Wood Preserving).
Carbolineum Co.

Pantagraphs for Mill Engraving.
Johnson, C. A., & Co.

Paper.
Merwin Paper Co.
Richardson Bros.

Paper Boards.
Merwin Paper Co.

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Howson & Howson.
Industrial Law League Inc.

Perforated Metals.
Hopkins Machine Works.

Peroxide of Sodium.
Roessler & Hassiacher Chemical Co.

Pipes and Fittings.
Scaife, W. B., & Sons.
Walworth Manufacturing Co.

Pneumatic Conveying.
——See Ventilating.

Portable Hoists.
Economy Engineering Co.

Power Transmission Machinery.
Almond, T. W., Mfg. Co.
American Mfg. Co.
American Pulley Co.
Cell Drier Machine Co.
Cresson, Geo. V., Company.
Dodge Mfg. Co.
Evans, G. Frank.
Farrel Foundry and Machine Co.
Hunter, Jas., Machine Co.
Kilburn, Lincoln & Co.
Link Belt Co.
Olney & Warrin.
Philadelphia Drying Machinery Co.
Plymouth Cordage Co.
Reeves Pulley Co.
Saginaw Manufacturing Co.
Schofield, Wm., Co.
Sellers, William, & Co.
Textile Finishing Machinery Co.
Tolhurst Machine Works.

Preparatory Machinery (Cotton).
Howard & Bullough Am. Machine Co.
Kitson Machine Co.
Leigh, Evan A.
Riley, C. E., Company.
Saco & Pettee Machine Shops.

Presses.
Boomer & Boschert Press Co.
Butterworth, H. W., & Sons Co.
Curtis & Marble Machine Co.
Gessner, David.
Hart, Charles.
Minnich Machine Works.
Phila. Drying Machinery Co.
Spence & Rideout.
Sullivan Machinery Co.
Textile Finishing Machinery Co.
Woonsocket Machine & Press Co.

Press Papers.
Merwin Paper Co.
Philadelphia Drying Mchy. Co.
Richardson Brothers (Importers and Dealers).

Pressure Regulators.
Crosby Steam Gage & Valve Co.
Walworth Mfg. Co.

Pulley Covering.
Olson, Chas. E. A.

Pulleys.
——See Power Transmission Machinery.

Pumps.
Dean Bros. Steam Pump Works.
Goulds Mfg. Co.
Philadelphia Drying Machinery Co.
Textile Finishing Machinery Co.

Pump Governors.
Crosby Steam Gage & Valve Co.
Dean Bros. Steam Pump Works.
Walworth Mfg. Co.

Purifying & Filtration Plants.
Dodge Mfg. Co.
Hungerford & Terry.
Norwood Engineering Co.
Scaife, W. B., & Sons.

Quillers.
Foster Machine Co.
Payne, G. W., & Co.
Universal Winding Co.

Rag Pickers.
Schofield, Wm., Co.
Smith & Furbush Machine Co.

Ramie Tops and Noils.
Tierney, Frank A.

Raw Hide Gears.
New Process Raw Hide Co.

Reed and Harness Manufacturers.
American Supply Co.
Garland Mfg. Co.
Nuttall, George.
Stewart & Sons.
Walder, J.

Reducing Valves.
Crosby Steam Gage & Valve Co.
Walworth Mfg. Co.

Regulators (Pressure).
Crosby Steam Gage & Valve Co.
Walworth Mfg. Co.

Ribbon Cutters.
Cameron Machine Co.

Ribbons.
Cheney Bros.

Ring Travelers.
DeHaven Mfg. Co.
Shaw, Victor, Ring Traveler Co.

Roofing.
Barrett Mfg. Co.
Standard Paint Co.

Roller Leather.
Jefferson, Edward & Brother.

Roll Coverers.
Burnham, E. E., & Co.

Rolls (Rubber Covered).
American Wringer Co.

Rope.
American Mfg. Co.
Dodge Mfg. Co.
Plymouth Cordage Co.

Rope Transmission.
American Mfg. Co.
Cresson, Geo. V., Company.
Dodge Mfg. Co.
Plymouth Cordage Co.

Roving Cans.
Hill, James, Mfg. Co.
Standard Fibre Co.

Ruberoid Roofing.
Standard Paint Co.

Scallop Machines.
Merrow Machine Co.

Schools.
International Correspondence Schools.
Lowell Textile School.
New Bedford Textile School.
Philadelphia Textile School.

Secondhand Machinery.
——See Mchry. Dealers, also classified Ads.

Separators (Yarn).
Draper Co., The.

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Resists great heat; not affected by climatic changes. Will not melt, crack, rot or corrode.

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Richards

municate with parties contemplating any additions or changes in mill equipments and to send circulars describing at length our machines and supplies.

& Co.

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SOUTHERN OFFICE, CHARLOTTE, N. C.

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Arlington Mch. Wks. (Arthur Birch, prop.)
Birch Bros., Somerville Machine Wks.
Curtis & Marble Machine Co.
Dinsmore Mfg. Co.
Fales, L. F.
Textile Finishing Machinery Co.
Union Special Machine Co.
Walter & Co.
Willcox & Gibbs Sewing Machine Co.

Shafting, Hangers, Etc.
——See Power Transmission Machinery.

Shearing Machinery.
——See Dyeing, Drying, Bleaching and Finishing.

Sheet Metal Work.
Scaife, W. B., & Sons.

Shell Rolls.
Thurston, A. G., & Son.

Shoddies.
——See Wool Shoddies.

Shuttles.
——See Bobbins, Spools, Shuttles, Etc.

Silk Machinery.
Arlington Mch. Wks. (Arthur Birch, prop.)
Butterworth, H. W., Sons Co.
Leigh, Evan A.
Mason Machine Works.
Stoddard, Haserick, Richards & Co.
Textile Finishing Machinery Co.

Silk Mill Supplies.
Hall, I. A., & Co.

Silk Noils.
Fawcett, Hughes.

Singe Plates.
Arlington Mch. Wks. (Arthur Birch, prop.)
Butterworth, H. W., Sons Co.
Taunton, New Bedford Copper Co.
Textile Finishing Machinery Co.

Singeing Machines.
Arlington Mch. Wks. (Arthur Birch, prop.)
Butterworth, H. W., Sons Co.
Curtis & Marble Machine Co.
Leigh, Evan A.
Philadelphia Drying Machinery Co.
Smith, Drum & Co.
Stubbs, Joseph.
Textile Finishing Machinery Co.

Sizing, Starch and Gums.
American Diamalt Co.
Arabol Mfg. Co.
Corn Products Refining Co.
Danker & Marston.
Stein, Hirsch & Co.
Vera Chemical Co.

Skylights.
Drouve, G., Co.
Van Noorden, E., Co.

Slashers.
Leigh, Evan A.
Lowell Machine Shop.
Riley, C. E., Company.

Soaps.
Dobbins Soap Mfg. Co.
Nicetown Mfg. Co.
Zurn, O. F., Co.

Spindles.
Bamford & Smith.
Bodden, Wm. & Son, Ltd.
Buckley's, Benjamin, Sons.
Calder Machine Works.
Draper Company.
Easton-Burnham Co.
Hopkins Machine Works.
Jefferson, Edward & Brother.
Leigh, Evan A.
Riley, C. E., Company.
Stoddard, Haserick, Richards & Co.
Vandegrift, Elias T.

Spindle Tubes.
Bamford & Smith.
Calder Machine Works.
Riley, C. E., Company.
Stoddard, Haserick, Richards & Co.
Vandegrift, Elias T.

Spinning Rings.
Draper Company.
Howard & Bullough American Machine Co.
Whitinsville Spinning Ring Co.

Spinning Tubes.
Buckley's, Benjamin, Sons.
Jefferson, Edward & Brother.

Spools.
——See Bobbins, Spools, Shuttles, Etc.

Spoolers.
Draper Company.
Easton & Burnham Machine Co.
Lindsay, Hyde & Co.
Lowell Machine Shop.
Payne, George W., & Co.

Stacks.
Scaife, W. B., & Sons.

Steam Boilers.
Scaife, W. B., & Sons.

Steam Boiler Insurance.
Hartford Steam Boiler Inspection & Insurance Co.

Steam Engines.
American Blower Co.
Arlington Mch. Wks. (Arthur Birch, prop.)
Buffalo Forge Co.
Fishkill Landing Machine Co.
Olney & Warrin.
Sturtevant, B. F., Co.
Textile Finishing Machinery Co.

Steam Heating.
American Blower Co.
Mass. Fan Co.

Steam Jacket Kettles.
Badger, E. B., & Sons Co.

Steam Pumps.
Dean Bros. Steam Pump Works.
Goulds Manufacturing Co., The.
Olney & Warrin.
Walworth Mfg. Co.

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Steam Specialties.
Berry Engineering Co.
Buffalo Forge Co.
Butterworth, H. W., Sons Co.
Crosby Steam Gage & Valve Co.
Sargent's Sons, C. G., Corp.
Sturtevant, B. F., Co.
Textile Finishing Machinery Co.
Walworth Manufacturing Co.

Steam Traps.
American Blower Co.
Buffalo Forge Co.
Sturtevant, B. F., Co.
Walworth Mfg. Co.

Steel Frame Construction.
Scaife, W. B., & Sons.

Stencil Machines.
Bradley, A. J.

Stop Motion for Knitting Machines.
Boss Knitting Machine Works.
Ruth Machine Co.

Stop Motion for Looms.
—See Warp Stop Motions.

Superheaters, Foster.
Power Specialty Co.

Tanks and Towers.
Chicago Bridge & Iron Works.

Tanks, Tubs and Vats.
Cypress Lumber Co.
Hall, Ames H., Son & Co.
Hopkins Machine Works.
Textile Finishing Machinery Co.
Tolhurst Machine Works.
Scaife, W. B., & Sons.
Stearns, A. T., Lumber Co.
Woolford, G., Tank Mfg. Co.

Tapes, Braids and Edgings.
Beacon Narrow Fabric Co.
Chapin, George W.
Friedberger-Aaron Mfg. Co.
Krout & Fite Mfg. Co.
Maurer, F. W., & Sons Co.
Weimar Bros.
Wick Narrow Fabric Co.

Telephones.
Pettes & Randall Co.

Temples.
Draper Co.

Textile-Engineer.
Buhlmann, A. W.

Textile Schools.
—See Schools.

Thin Place Preventer.
Clayton & Bentley Co.

Thread Guide (Adjustable).
Palmer, I. E., Co.

Tiering Machines.
Economy Engineering Co.

Top Cutting Machines.
Robinhold Machine Co.
Wildman Mfg. Co.

Trade Mark Stamps.
Kaumagraph Co.

Trucks.
Bailey, Frank.

Turbines.
—See Water Wheels.

Twine.
American Mfg. Co.
Plymouth Cordage Co.
Richardson Bros.

Twisting Machinery.
Brockway & Meckenstrum.
Jefferson, Edward & Brother.
Lowell Machine Shop.
Smith & Furbush Machine Co.

Valves.
Crosby Steam Gage & Valve Co.
Jolly, J. & W.
Walworth Mfg. Co.

Variable Speed Transmission.
Cell Drier Machine Co.
Reeves Pulley Co.

Ventilating Apparatus.
American Moistening Co.
American Blower Co.
Berry, A. Hun.
Buffalo Forge Co.
Crocker-Wheeler Co.
Drouve, G., Co.
Massachusetts Fan Co.
Parks, G. M., Co.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Tolhurst Machine Works.
Sargent's, C. G., Sons.
Schnitzler, Chas. H.
Sturtevant, B. F., Co.
Walworth Mfg. Co.

Warp Compressors.
Worcester Warp Compressing Machine Co.

Warpers.
Draper Company.
Entwistle, T. C., Co.
Lowell Machine Shop.

Warping and Beaming Machinery.
Altemus, J. K.
Draper Company.
Entwistle, T. C., Co.
Smith & Furbush Machine Co.

Warp Stop Motions.
American Textile Appliances Co.
Draper Company.
Kip-Armstrong Co.

Washers (Cloth).
Arlington Mch. Works (Arthur Birch, prop.)
Birch, Arthur, Arlington Mch. Works.
Birch Bros., Somerville Machine Wks.
Butterworth, H. W., & Sons Co.
Hunter, Jas., Machine Co.
Kenyon, D. R., & Son.
Philadelphia Drying Machinery Co.
Textile Finishing Machinery Co.

Washing Soda.
Ford, J. B., Co.

Watchman's Clocks.
Holtzer-Cabot Electric Co.
Nanz, T., Clock Co.
Pettes & Randall Co.

Water Chemists.
Scaife, W. B., & Sons Co.

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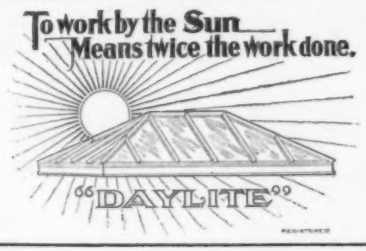

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in plant manufacturing ladies', childern's, misses' and full line of sweaters—one that understands cutting and making up sweaters to fit—and can take charge of hands in finishing room. Address "C. K. N.," care Textile World Record, Boston, Mass.

Wanted Experienced and Practical Hosiery Knitter

to take full charge of Knitters, Ribbers, Topping and Looping on piece work. Capacity at present 40 doz. fine hosiery per day. Will increase as fast as practicable. Good chance for a first class man. Will guarantee a fixed wage to start. Address, "C.M.T.," care Textile World Record, Boston, Mass.

STARCHER AND FINISHER

We want a man conversant with clay filled bag work. Steady work. Good wages. References required. Apply Bleachery, Box 773, Atlanta, Ga.

Hosiery Finisher Wanted.

Wanted, a foreman to take charge of the Finishing Department of a mill making about 2500 dozen Half Hose, Ribbed Hose and Ladies' Hose per day. None but a first class man with reliable references need apply. State wages wanted.
RICHMOND HOSIERY MILLS, Chattanooga, Tenn.

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very well introduced, first class factory equipment,

Desires to Import American Special Machines for Underwear Trade

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Tuscan Softener, Turkey Red Oil, (all grades) Soluble Oils and Olive Oil.

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Also manufacturers of **Oil** Stencil Board. Write for prices and samples.

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I HAVE had a great deal of experience in straightening out troubles in wool card rooms. I believe I have worked in more wool card rooms than any other man in this country, and it has given me an unusual opportunity for noting all sorts of difficulties and the best way of overcoming them. Sometimes an outsider will quickly detect a point which the man always on the spot may overlook. Sometimes it is not necessary to visit the mills, as I can tell what the trouble is by correspondence. My charges are very reasonable and manufacturers and overseers may address me in confidence, as I am not looking for a permanent position as carder.

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SAM DRIVER, care Textile World Record, 144 Congress St., Boston.

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INTERNATIONAL CORRESPONDENCE SCHOOLS, Box 882, Scranton, Pa.

Situations Wanted.

The following advertisements are a portion of those of superintendents and overseers, of whom full particulars are on file at this office. Manufactu ers who may be in need of such men may address them in care of Textile World Record, Boston, or state their requirements directly, and the addresses of suitable men will be furnished without charge.

Mr. C. T. Donlevy, a practical mill overseer and superintendent, who has a wide acquaintance with mill men, gives special attention to this department. He would be pleased to hear from any of his friends who may be interested. Address Textile World Record, 144 Congress St., Boston, Mass.

SUPERINTENDENTS.

Superintendent of a Ribbed Underwear Mill, assistant superintendent or overseer of finishing in a large mill. Worked on men's, ladies', children's underwear and government and merino knit underwear. Familiar with all makes of machinery. 38 years of age, married. Good reference. 4677, Textile World Record, Boston, Mass.

Superintendent of an Underwear Mill or overseer of finishing in a large plant. Worked on ladies' underwear and novelty. Familiar with all makes of finishing machinery and expert on Merrow machines. Will not go West, South or Canada. 45 years of age, married. 4674, Textile World Record, Boston, Mass.

Superintendent or Assistant Superintendent of a woolen or knitting mill. Has manufactured woolen goods, blankets, flannels, shirtings, hosiery and yarns. Familiar with Crompton & Knowles looms, D. & F. carding and spinning machinery and Branson knitters. Will not go to Maine, New Hampshire, Vermont or Canada. 32 years of age, married. Good reference. 4686, Textile World Record, Boston, Mass.

Superintendent of a Cotton Mill or overseer of carding in a large mill. Worked on yarns of all kinds, combed and carded. Understands all makes of machinery. 29 years of age, married. Good reference. 4675, Textile World Record, Boston, Mass.

Agent or Superintendent of a woolen or worsted mill. Worked on all classes of worsted and woolen goods; can furnish first class reference. 50 years of age, widower. 4681, Textile World Record, Boston, Mass.

Assistant Superintendent in a cotton mill or position as overseer of carding or spinning. Worked on all kinds of cotton goods, wool mixes, ginghams, tickings, denims, linings, etc. Familiar with all makes of cotton machinery. Has had a number of years experience in different departments in mills, machine shops, engineering, weaving, carding and spinning. Good reference. Will go any place for a good position. 4609, Textile World Record, Boston, Mass.

Superintendent of a Cotton Mill. Worked on drills, ducks, sateens, lenos, American, Sea Island and Egyptian cottons. Familiar with all makes of American and English machinery. 40 years of age, married. Good reference. 4597, Textile World Record, Boston, Mass.

Agent or Superintendent of a cotton mill. Worked on all classes of cotton goods, white and colored, plain and fancy. Familiar with all makes of cotton machinery used in the above goods. Prefers New England or New York State. 45 years of age, married. Good reference. 4603, Textile World Record, Boston, Mass.

Agent or Superintendent of a cotton mill. Position wanted by a man, 40 years of age, American, married. Familiar with fancy, colored and plain goods of all kinds. Familiar with all kinds of cotton machinery. Has been overseer for a number of years in first class mill. Could take a position at short notice. Good reference. 3814, Textile World Record, Boston, Mass.

Superintendent or Agent of Cotton Mill. Position wanted by a man 43 years of age, married, American. Has worked on all kinds of cotton and worsted goods, and is familiar with Draper, Crompton & Knowles, Lowell, Whitin, Mason, Kilbourn and Lincoln looms. Good references. 3669, Textile World Record, Boston, Mass.

Manager of a Hosiery Mill. Familiar with woolen, worsted and cotton and full-fashioned seamless hosiery. 45 years old, American. First-class references. 1657, Textile World Record, Boston, Mass.

SUPERINTENDENTS AND DESIGNERS.

Superintendent or Designer in a Woolen Mill. Worked on all classes of worsted goods. Familiar with all makes of machinery. Good reference. 50 years of age, married. 4673, Textile World Record, Boston, Mass.

Superintendent and Designer in a woolen mill. Position wanted by a man 31 years of age, Scotch-American. Is familiar with woolens, worsteds, thibets, cotton warps, dress goods, broad cloth, cotton worsteds, tourist cloth. All kinds of woolen machines. Will not go West. Good references. 3944, Textile World Record.

Superintendent and Designer. Position wanted by a man 38 years of age; married; worked on men's wear fancy worsteds, cotton worsteds, overcoatings and dress goods. Good references. 3056, Textile World Record, Boston, Mass.

Superintendent, Designer or boss weaver. Position wanted by a man 39 years of age, married. Has worked on woolen and worsted. Would take a position anywhere. First class reference. 3925, Textile World Record, Boston.

Superintendent and designer, or assistant superintendent. Age 34; married. Worked on cloths ranging from all cotton to all wool and worsteds, such as cotton worsteds, jeans, army cloths, kerseys, etc. Excellent references. 3148, Textile World Record.

Superintendent or Designer in a woolen mill. Position wanted by a man 47 years of age, married, American. Worked on all kinds of woolen and worsted goods. Familiar with all kinds of woolen machinery. Four workers in the family. 3977 Textile World Record.

Superintendent, Assistant Superintendent and Designer, or overseer of weaving and finishing. Position wanted by a man 33 years of age, American. Is experienced on ginghams, madras, shirtings, linings, lawns, silks and ducks. Is familiar with all kinds of cotton machinery. Good references. 3616, Textile World Record, Boston, Mass.

Assistant Superintendent and Assistant Designer. Position wanted by a man 27 years of age, German. Has worked on fancy cassimeres, overcoatings and dress goods. Is familiar with Crompton & Knowles looms. Good references. 3681, Textile World Record, Boston, Mass.

Assistant Superintendent, or Assistant Designer in a large woolen mill, or Assistant Superintendent and Designer in a medium sized woolen mill. Position wanted by a man 38 years of age, American, single. Worked on tourists' coatings, shirtings, dress goods, broadcloths, kerseys, etc. Good references. 4034, Textile World Record, Boston.

Assistant Superintendent or assistant designer in a worsted or woolen mill. Position wanted by a man 32 years of age, single, American. Has worked on fine worsted and woolens, worsted and wool overcoatings, low grade worsted and woolens, men's wear and dress goods. Familiar with American and English machinery. Good reference. 3839, Textile World Record, Boston, Mass.

Superintendent and Designer in a woolen or worsted mill. Worked on all kinds of men's and women's wear, worsted, wool, shoddy and cotton mixes and piece dyes. Familiar with all kinds of woolen machinery. 43 years of age, married. Good reference. 4610, Textile World Record, Boston, Mass.

Superintendent and Designer in a woolen mill. Position wanted by a man, 30 years of age, single, Scotch. Has worked on all kinds of men's wear, wool and worsted, plain and fancy, also dress goods. Familiar with all kinds of machinery. Will go any place for a good position. First class references. 3749, Textile World Record, Boston, Mass.

KNITTERS.

Overseer of Knitting. Worked on all fleece work, elderdowns, merino nets, cottonets, jerseys, buffalo cloths and astrachans. Familiar with Tompkins, Campbell & Clute, Gormley and Crane machines. Does not understand ribbed or latch needle machines. Will not go South or Canada. Good reference. 30 years of age, married. 4671, Textile World Record, Boston, Mass.

Boss Knitter or second-hand in an underwear mill. Familiar with silk, worsted, cotton and mixed yarn of all kinds. Will not go West, South or to Canada. 32 years of age; American; married. 1819, Textile World Record, Boston, Mass.

Overseer of Knitting or hosiery machine fixer or foreman in the finishing department. Position wanted by a man 25 years of age, single. Has worked on fine cotton and mercerized hosiery. Would prefer a position on Jenckes Invincible machines, but has a good knowledge of Scott & Williams, Wildman, Geo. D. Mayo, Acme and Brinton footers. 4541, Textile World Record, Boston, Mass.

Superintendent or boss knitter. 30 years of age, married. Worked on men's plain and plaited fancy hose, ladies' plain and lace and misses' ribbed hosiery. Familiar with the Geo. D. Mayo, Acme, Paxton & O'Neil, Standard footers; McMichael and Wildman, Brinton ribbers and different makes of welters and loopers. Good reference. 4549, Textile World Record, Boston, Mass.

Superintendent, or Overseer of Knitting in a Hosiery Mill. Position wanted by a man 33 years of age, single, has worked on ladies', men's and misses' wool, worsted and cotton seamless hosiery on Wildman, Scott & Williams, Ruth and Brinton ribbers, Hepworth and Beatley loopers, Acme and Geor. D. Mayo automatic foot machine. Good recommendations. 3698, Textile World Record.

Overseer of Knitting. Position wanted by a man 39 years of age, married. Worked on double and single plush, plain single thread wool; worked on spring needle, also run wool and cotton on latch needle machines, Thompkins spring, Snyder, Fisher, McMichael & Wildman, Stafford, Holt latch needle, Payne, Tompkins winders. Good reference. 4073, Textile World Record. Boston, Mass.

Overseer of Knitting. Position wanted by a man 30 years of age, single. Worked on ladies' and gents' ribbed goods, shaped and plain. Familiar with Tiffany & Cooper cuff machines, Campbell & Clute machines, Scott & Williams, Smith & Fisher latch needle knitting machines. Will accept a position in New York state only. Good references. 3964 Textile World Record.

Superintendent or Overseer of Knitting. First-class man with a quarter of a century experience in some of the largest and best mills in the country. Has always succeeded in reducing waste and increasing quality and quantity of production. Familiar with spring needle circular machines on elderdowns, stockinets, jerseys, fleeces and astrachans. Has several improvements on knitting machines. Age, 38 years, and married. Good reference. 4087, Textile World Record, Boston, Mass.

Overseer of Knitting. Position wanted by a man 29 years of age, married. Worked on fleece lined, balbriggans, mercerized cotton, fancy worsted, wool merino nets, heavy and light weight ribbed work. Familiar with Campbell & Clute, Tompkins Bros., Bromley & Crane, latch needle, Scott & Williams, Nye & Tredick, Fisher, and Wildman machines. Good references. 3881, Textile World Record.

Overseer of Latch Needle Knitting. Position wanted by a man 27 years of age, single. Has worked on almost all grades of stitchers of ladies' and gents' cotton and worsted underwear. Familiar with Scott & Williams, Wildman, Snyder, Nye & Tredick, Stafford & Holt and Fisher machines. Can take a position at short notice. Good references. 3873, Textile World Record.

Superintendent of Knitting. A man with 27 years' experience running knitting factories on sweaters, cardigan and ladies' golf jackets, also gloves and mittens. Understands all makes of knitting and finishing machinery used in manufacturing these goods. 45 years of age. Good reference. 4521, Textile World Record, Boston, Mass.

SPINNERS.

Overseer of Ring Spinning, spooling and warping, or second in large mill. Worked on yarns from 10s to 70s. Whitin, Fales & Jencks and Mason machines. Good reference. 34 years of age, married. 4672, Textile World Record, Boston, Mass.

Overseer of Ring Spinning, spooling and warping. Worked on sheetings, ducks, crash, etc. Familiar with all makes of ring spinning machinery. Good reference. 50 years of age, married. 4688, Textile World Record, Boston, Mass.

Overseer of Ring Spinning Cotton Mill. Position wanted by a man 30 years of age, single; has had a number of years' experience in different departments, a graduate of a well known textile school, understands different makes of machinery, good reference as to character and ability. 4047 Textile World Record, Boston.

Overseer of Woolen Spinning or second hand. 30 years of age, widower. Worked on all kinds of woolen goods and yarns from 7/8 to 6 run. Familiar with D. & F. machines. Will not go South. Good reference. 4586, Textile World Record, Boston, Mass.

Boss Spinner in a woolen mill. 32 years of age; American; familiar with Davis & Furber, Johnson & Bassett and English mules and twisters. First-class references. 3275, Textile World Record.

Overseer of Woolen Spinning. Position wanted by married man, 28 years of age; worked on all kinds of wool, cotton and shoddy mix goods on J. & B. mules. Good reference. Will not go West, South or Canada. 4083, Textile World Record, Boston, Mass.

Overseer of Knitting in a small mill or second hand in a large mill. 22 years of age, single. Worked on balbriggans, single and double, and fleece lined. Familiar with Tompkins, Campbell & Clute and Payne winders. Could take a position at short notice. Good reference. 4539, Textile World Record, Boston, Mass.

Overseer of Woolen Spinning in a small mill, or Fixer in a large mill. Single, 38 years of age. Has worked on all kinds of stock, cotton, wool and shoddy mixes. Familiar with J. & B. and D. & F. operators and mules. Could take a position at once. Good reference. 4092, Textile World Record, Boston, Mass.

Overseer of Spinning. American, with experience on nearly all classes of woolen and worsted goods, and on all machinery used in his work, wants position in the East. Best of references furnished. Wants first-class position. 3384, Textile World Record.

Overseer of Spinning in Woolen Mill. Position wanted by a married man, 40 years of age. Is familiar with Davis & Furber and Johnson & Bassett mules and operators and Wright's frames. Good reference. 4086, Textile World Record, Boston, Mass.

Overseer of Spinning in a woolen mill. Position wanted by a man 47 years of age, married. Has worked on fancy cassimeres, dress goods, flannels, satinets, kerseys, broadcloths, blankets, etc. Familiar with D. & F., J. & B., Paul and Bancroft mules. Will not go West, South, Canada, Pennsylvania or New Jersey. Good references. 3994 Textile World Record.

Overseer of Woolen Spinning, twisting and spooling. Position wanted by a married man, 45 years of age, American. Worked on all classes of goods, including knit goods. Familiar with the D. & F., J. & B., and Bancroft mules. Will accept a position anywhere but R. I. and N. J. Good reference. 4581, Textile World Record. Boston, Mass.

Overseer of Woolen Spinning or fixing. 41 years of age, married. Has worked on all kinds of woolen goods. Familiar with the D. & F. and J. & B. machines. Prefers N. E. States. Has one sewer and one burler in the family. Good reference. 4590. Textile World Record, Boston, Mass.

Overseer of Cotton Mule Spinning. 30 years of age, married. Worked on plain and fancy goods of all kinds. Familiar with the American and English makes of mules. Prefers a position in Mass., R. I., or Conn. Good reference. 4585, Textile World Record, Boston, Mass.

WEAVERS.

Overseer of Weaving in a small mill or loom fixer. Worked on wool and worsteds. Familiar with Knowles looms. 28 years of age, single. Good reference. 4684, Textile World Record, Boston, Mass.

Overseer Cotton Weaving or Second Hand in a large mill. 33 years of age, American. Worked on plain and fancy lenos, sateens, twills, etc. Familiar with the Whitin, Colvin, Mason, Crompton & Knowles and Draper looms. Good reference. Will not go West or South. 4514, Textile World Record, Boston, Mass.

Overseer of Weaving. Englishman; 33 years of age; married; worked on fine lawns, sheetings, sateens and fancies, coarse drills, twills, bicycle cloth, automobile cloth for tires. Familiar with Whitin, Crompton, Knowles, Mason, Kilburn & Lincoln and Lowell machines. 3073, Textile World Record.

Overseer of Weaving and designing in a woolen mill. Might accept a position as loom fixer at good wages. 34 years of age, single. Worked on men's wear, ladies' dress goods, cotton warp, blankets, etc. Familiar with the Crompton & Knowles looms. Good reference. 4583, Textile World Record, Boston, Mass.

Overseer of Woolen Weaving. American, 37 years of age, accustomed to fancy worsteds and woolens, dress goods, etc. Held last position 6 years. Prefers the East. 3397, Textile World Record, Boston.

Overseer of Woolen Weaving. 33 years of age, married. Worked on woolen and worsteds, cotton worsteds and dress goods. Familiar with the Crompton & Knowles looms. Will not go West, South or Canada. Good reference. 4507, Textile World Record, Boston, Mass.

Overseer of Woolen Weaving. 43 years of age, married. Has worked on all kinds of woolen and worsted goods. Understands Crompton & Knowles looms. Would prefer a position in the New England states. Good reference. 4504, Textile World Record, Boston, Mass.

Overseer of Weaving. Position wanted by a man 42 years of age, American, married, worked on all kinds of woolen and worsted goods, familiar with Crompton & Knowles and Crompton & Thayer and Jacquard looms, first class recommendation. 3694, Textile World Record.

Overseer of Woolen Weaving, Second Hand or loom fixer in a good mill. 34 years of age, married. Has worked on fancy woolens, worsteds, blankets, etc. Familiar with Crompton & Knowles looms. Will not go West, South or Canada. Good reference. 4517, Textile World Record, Boston, Mass.

Overseer of Woolen Weaving, 44 years of age, with experience on woolen and worsted cassimeres, dress goods, overcoatings, etc., and on Knowles and Crompton looms. Would like position in the Middle West. 3385, Textile World Record, Boston.

Overseer of Woolen Weaving or assistant designer. Position wanted by a man 33 years of age, married, German-American. Worked on woolen and worsted. Has had 12 years' experience as loom fixer; also textile school training in designing. Worked on high and low grade woolen and worsteds. Prefers a position in the New England States. Good references. 3962 Textile World Record.

Overseer of Cotton Weaving. Married, 38 years of age. Has worked on sateens, plain and fancy cotton goods. Is familiar with Whitin, Crompton & Knowles and Mason looms and could take a position at once. Good reference. 4090, Textile World Record, Boston, Mass.

Overseer of Cotton Weaving, or Assistant Superintendent. 42 years of age, married. Has worked on all kinds of cotton goods, coarse and fine, plain and fancy. Is familiar with all kinds of looms and an expert on Draper automatic looms. Good reference. Could take a position at once. 4089, Textile World Record, Boston, Mass.

WEAVERS.

Overseer of Weaving, Assistant Superintendent, or superintendent in a cotton mill. Position wanted by a man 46 years of age, married, American. Worked on prints, sheetings, shirtings, ducks, dress goods, leno, Jacquards, cottons from 4s to 113s warp, and 2.80 to 120 filling. Also on silks from 60s to 345s. Familiar with Lowell, Whitin, Draper, Mason, Lewiston, Knowles, Woonsocket, Colvin looms. Will not go to New York, New Jersey, Pennsylvania, West or South. Good references. 4014 Textile World Record.

Overseer of Weaving or general second hand in a cotton mill. Position wanted by a man, 28 years of age, American, married. Worked on twills, sheetings, drills, sateens, etc. Familiar with Mason, Colvin, Whitin & Draper looms. Good references. 3548, Textile World Record, Boston.

Overseer of Weaving in a cotton mill. Position wanted by a man 27 years of age, American. Worked on plain, twills, sateens, fancies, lenos, flannels, etc. Familiar with Crompton & Knowles, Whitin, Lowell and Mason looms. Good references. 3968 Textile World Record.

Overseer of Weaving in a cotton mill, or second hand in a large mill. Position wanted by a man 22 years of age, married. Has worked on plain, sateens, twills and fancy. Some experience on lenos. Familiar with Whitin, Colvin, Mason, Lowell, Lewiston, Crompton & Knowles looms, electric stop motion. Good references. 3916, Textile World Record, Boston.

Overseer of Cotton Weaving. Position wanted by a man, 39 years of age, American, married. Worked on all kinds of cotton goods, plain and fancy. On English, Colvin, Mason, Whitin and Draper looms. Could take a position at two weeks' notice. First class recommendations. 3735, Textile World Record, Boston, Mass.

Overseer of Weaving or dressing in a small woolen mill. Worked on wool and worsted goods. Familiar with the Knowles loom and different makes of dressing machines. 42 years of age, English, married. Good reference. 4594, Textile World Record, Boston, Mass.

Overseer of Woolen Weaving or second hand in a good mill. Worked on cassimeres, meltons, kerseys, piece dyes, plain and fancy goods. Understands Knowles looms. 26 years of age, single. Good reference. 4612, Textile World Record, Boston, Mass.

Overseer of Woolen or worsted weaving in a small or loom fixer in a large mill. Worked on worsted and woolen goods. Familiar with the Knowles loom. Good reference. 38 years of age, married. 4600, Textile World Record, Boston, Mass.

Overseer of Woolen Weaving or second hand in a woolen mill. Worked on meltons, thibets, union cassimeres and fancy woolen goods. Familiar with the Crompton & Knowles, Stafford, Gilbert and dobby looms. Would like a position where there are Draper looms to get experience. N. E. States only. Good reference. 4599, Textile World Record, Boston, Mass.

Overseer of Weaving or Asst. Supt. Position wanted by a man 48 years of age, married. Has worked on all kinds of fancy woolen and worsted goods, wool and cotton and wool and shoddy mixes, and fancy cotton dress goods; can also design. Is familiar with Crompton & Knowles looms, Gilbert looms and dobby-heads, and Whitin plain and fancy looms. Has good references. 3501, Textile World Record.

Overseer of Woolen Weaving. 18 years' experience as overseer. Worked on cassimeres, cloakings, chinchillas, cheviots, beavers, meltons, shawls, also worsteds and on Crompton and Knowles looms, wants a position in the East. Good references. 3422, Textile World Record, Boston.

Overseer of Weaving in a woolen mill. Position wanted by a man 37 years of age, married. Familiar with all classes of woolens, fancy worsteds, cotton worsteds, unions. Familiar with Crompton & Knowles, Crompton & Thayer, Draper automatic looms. Good references. Will not go to Canada. **3965 Textile World Record.**

CARDERS.

Overseer of Cotton Carding. Worked on sheetings and hosiery yarns. Familiar with all makes of carding machinery. 30 years of age, married. Good reference. 4682, Textile World Record, Boston, Mass.

Overseer of Woolen Carding. Worked on all kinds of woolen goods, made from wool, cotton and shoddy mixes. Familiar with all makes of woolen carding machinery. Good reference. 46 years of age, single. 4685, Textile World Record, Boston, Mass.

Overseer of Woolen Carding. 36 years of age, American, married. Worked on all kinds of woolen shoddy and cotton mixed goods. Familiar with the different American makes of carding machinery. Will not go to Penn., West, South or Canada. Good reference. 4577, Textile World Record, Boston, Mass.

Overseer of Carding and spinning or woolen carding and spinning. Might accept a position as second hand in a large mill. 38 years of age. Worked on cassimeres, dress goods, overcoatings, horse and bed blankets. Familiar with the D. & F., Lumbard, Furbush, Cleveland and Platt mules. Will not go West, South or Canada. Good reference. 4582, Textile World Record, Boston, Mass.

Overseer of Woolen Carding or garnetting. Married man 44 years of age, American. Worked on all kinds of woolen goods, also cotton and shoddy mixes. Familiar with all kinds of cards and garnet machines. Will not go to Canada. Good reference. 4559, Textile World Record, Boston, Mass.

Overseer of Carding in a Knitting or Hosiery Mill, or Assistant Superintendent. 41 years of age, married. Now employed, but wishes to change. Has worked on all kinds of knit goods, wool, cotton and shoddy mixtures. Is familiar with D. & F., Furbush, Cleveland and Smith cards. Will not go to Canada. Good reference. 4098, Textile World Record, Boston, Mass.

Overseer of Woolen Carding and spinning. Worked on fancy cassimeres, tweeds, all grades of woolen goods, made from wool, cotton and shoddy mixes. Familiar with Davis & Furber mules and all makes of cards. Would accept a position anywhere where there is a healthy climate. 45 years of age, married. Good reference. 4615, Textile World Record, Boston, Mass.

Overseer of Woolen Carding or carding and spinning. Worked on all kinds of woolen, cotton and shoddy mixes. Familiar with all makes of carding machinery, D. & F., J. & B., and Bancroft mules. Could take a position at once. Good reference. 4608, Textile World Record, Boston, Mass.

Overseer of Woolen Carding. Worked on all kinds of woolen goods, also cotton, wool and shoddy mixes. Familiar with all makes of carding machinery. Will go any place for a good position. Good reference. 35 years of age, married. 4606, Textile World Record, Boston, Mass.

Overseer of Woolen Carding, or Carder and Spinner. Position wanted by a man 36 years of age, married, worked on all kinds of stock, wool shoddy, cotton, mixed goods, understand all makes of cards and J. & B., D. & F. mules. Good reference; will not go to Maine, Pennsylvania, West, South or Canada. 4037, Textile World Record, Boston.

Overseer of Woolen or worsted carding. Would accept a position as superintendent of a felt mill. Understand the business in every detail. Worked on all kinds of stock and all makes of cards. First class reference. Will go any place for a good position. 45 years of age, American, married. 3470, Textile World Record, Boston.

Overseer of Woolen Carding. Position wanted by man 46 years of age, widower, worked on all kinds of woolen goods and on all kind of stock, wool, cotton and shoddy mixes. Good reference from four leading mills where employed, could take position at once as mill where last employed have stopped carding. 4039, Textile World Record, Boston.

Overseer of Woolen and Worsted Carding. Position wanted by a married man, 38 years of age; has worked on knitting and hosiery yarns. Is familiar with all makes of carding machinery. Good reference. Could take a position at short notice. Prefers a position in the New England or Middle States. 4088, Textile World Record, Boston, Mass.

FINISHERS.

Overseer of Wet Finishing or second hand in fulling room. Worked on low and high grade woolens and worsteds. Good reference. 28 years of age, single. 4680, Textile World Record, Boston, Mass.

Overseer of Woolen and Worsted Finishing. Worked on piece dyes, worsteds, cassimeres, cross dyes, carriage cloths, face finished goods and blankets. Familiar with all makes of finishing machinery. Prefers the Middle West. Good reference. 36 years of age, married. 4670, Textile World Record, Boston, Mass.

Overseer of Finishing in a small woolen or second hand in a large mill. Worked on face finished goods, beavers, kerseys, cassimeres and worsteds. Good experience on gigging. Understands all machines. Good reference. 30 years of age, single. 4676, Textile World Record, Boston, Mass.

Overseer of Finishing. Position wanted by a man, 34 years of age, English, married. Worked on beavers, meltons, friezes, cassimeres, satinettes, chinchillas, cotton fancy and piece dyed worsteds. First class recommendation. 3729, Textile World Record, Boston, Mass.

Superintendent of bleaching and finishing cotton goods. Worked on all kinds of cheese cloth, buttercloth, sheetings, quilts, cambrics, long cloth, ducks and drills. Age 31; English; married. 3218, Textile World Record, Boston, Mass.

Overseer of Woolen Finishing. Position wanted by married man 30 years of age; worked on cheviots, dress goods, all grades of worsteds, overcoatings, suitings. 4048 Textile World Record, Boston.

Overseer of Finishing. Worked on all kinds of men's wear, fancies and piece dyed woolens and worsteds, dress goods of every description and face goods. First-class references; 36 years of age; Scotch. 3273, Textile World Record, Boston, Mass.

Overseer of Finishing and Napping of cotton goods. Position wanted by a man, 33 years of age, Canadian, married. Has worked on oxfords, ginghams, chambrays, dress goods, flannellettes, blankets, domets, etc. Is familiar with all kinds of American, German and English finishing machinery, tenter frames, calenders, stretchers, presses and nappers. Good reference. 3772, Textile World Record, Boston.

Overseer of Finishing, assistant finisher or boss burler and sewer. Worked on all grades of woolen and worsted goods, cotton mixes. Familiar with all leading makes of finishing machinery. Could take a position at one week's notice. Prefer New England or Middle Atlantic States. Good reference. 3896, Textile World Record, Boston, Mass.

Overseer of Finishing, wet finisher or general second hand in a woolen mill. Familiar with woolens and worsteds, cotton worsteds, cotton mixes, thibets and steam finished goods. Also all makes of finishing machinery. Will accept a position most any place. 28 years of age, good reference. 4602, Textile World Record, Boston, Mass.

Overseer of Finishing, second hand or finished percher. Worked on broadcloths, kerseys, thibets, sackings, venetians, cassimeres, unions, cotton mixes, dress goods and worsteds. Understands all makes of finishing machinery. Prefers a position in the New England States. 4611, Textile World Record, Boston, Mass.

Overseer of Finishing in a hosiery mill, stock keeper or overseer of production. Worked on men's, women's, boys' and children's flat and ribbed hosiery, made from cotton, carded, combed and Egyptian. Also embroidered worsted and merino goods. Familiar with all makes of finishing machines. Prefers a position in the South. 32 years of age, married. Good reference. 4618, Textile World Record, Boston, Mass.

Overseer of Woolen or worsted finishing. Worked on all grades of woolen and worsted goods. 43 years of age, married. Familiar with all makes of finishing machinery. Will not go West, South or Canada. Good reference. 4596, Textile World Record, Boston, Mass.

Overseer of Finishing. Age 30, American, unmarried, with 6 years' experience as overseer, wants position in New England. Had experience on satinets, unions, and all goods where cotton warp is used, also on nearly all machinery used in making these goods. 3335, Textile World Record.

DYERS.

Overseer of Dyeing. Worked on resist colors, develop shades in cotton worsted, wool; stock dyeing and yarns. Good reference. 40 years of age, married. 4679, Textile World Record, Boston, Mass.

Overseer of Silk Dyeing. Worked on all kinds of silk yarn and piece dyeing. Would accept a position in two weeks' notice. 35 years of age, married. Good reference. 4616, Textile World Record, Boston, Mass.

Overseer of Dyeing. Position wanted by a man 33 years of age, married and American. Has worked on fancy worsted and woolens, piece dyes, carriage goods, wool and worsted dress goods, men's wear, raw stock, cotton, worsted and linen yarns. Is familiar with Klauder-Weldon dyeing machinery. Good references. 3584, Textile World Record, Boston, Mass.

Overseer of Dyeing. A man 46 years of age, married. Worked on knit underwear, woolens, yarns, etc. Familiar with all kinds of machinery. Good reference. 4511, Textile World Record, Boston, Mass.

Overseer of Dyeing. Position wanted by a man, 45 years of age, Scotch, married. Has worked on raw stock, cotton and woolen goods, knit goods in the garment and in the roll. Familiar with all kinds of dyeing machinery used in the dyeing of knit goods. Prefers a position in New York State. Good reference. 3803, Textile World Record, Boston, Mass.

Boss Dyer. Position wanted by a man 29 years of age, married. Has worked on cotton, wool and shoddy, raw stock, piece dye, silk noiles, cotton and worsted yarns. Can show bright shade on shoddy fast fulling, acid, aniline and sulphur colors. Good references. 3914, Textile World Record, Boston.

Boss Dyer in a Woolen Mill. Position wanted by a man 23 years of age, married, American. Worked on worsteds and woolens, raw stock, skein and piece goods. Familiar with Klauder & Weldon machines for yarn. Will not go South. Good references. 4036 Textile World Record, Boston.

DYERS.

Overseer of Dyeing. Worked on raw stock, slubbing, yarns and piece dyes. Will not go West, South or Canada. 38 years of age, married, English. 4687, Textile World Record, Boston, Mass.

Overseer of Dyeing and starching cotton piece goods. Position wanted by a man who has had a wide experience on all kinds of cotton piece goods, is familiar with jig, two and three box machines, also one box padding machine; 45 years of age, American. Good reference. 3781, Textile World Record, Boston.

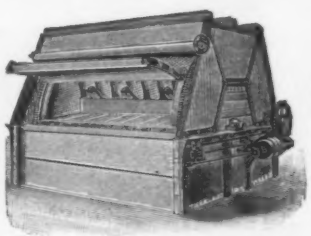
Boss Dyer, scourer and bleacher in a knitting mill. Worked on all grades of knitted underwear. First-class references. Will not go West or to Canada. 41 years old; married. 3004, Textile World Record.

Overseer of Dyeing. Or would accept a position as second hand in a mill on loose cotton and silk in order to get experience. Now employed as overseer on piece dyes, cost dyes and is familiar also with indigo dyeing. Good reference. 3936, Textile World Record.

Expert Hosiery Dyer. Age 27; married and sober. Desires position of superintendent of dyeing in a first-class hosiery mill, one manufacturing high grade goods preferred. Has had over seven years' practical experience in dyeing one of the best aniline blacks on cotton, also fast colors on cotton, wool, silk and union hosiery. Best of references furnished. 2052, Textile World Record.

Boss Dyer and Finisher. Familiar with silk, cotton, wool, underwear; also shirtings, scouring, fulling and bleaching. First-class recommendations. 928, Textile World Record, Boston, Mass.

Boss Dyer. Worked on cotton and wool and mixed stock, yarns and piece goods, hosiery, slubbing and raw stock; also scouring of wool; first-class recommendations; 28 years of age; single; English. 3327, Textile World Record, Boston, Mass.



RAW WOOL AND COTTON MACHINE.

MACHINES sold on 2 MONTHS' TRIAL

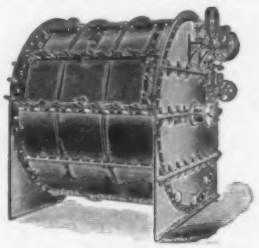
YOU TAKE NO RISK

SKEIN AND SLUBBING MACHINE.

THE KLAUDER-WELDON DYEING MACHINE COMPANY

P. O. Box K, AMSTERDAM, N. Y.

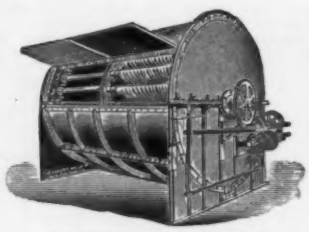
Machines for Dyeing, Bleaching and Scouring Woolen, Worsted, Cotton and Silk Skeins—Slubbing—Raw Cotton and Wool, Waste, Rags, Shoddy, Hosiery, Underwear, Hats, Caps, Knit Cloth, Tapes, etc.



SULPHUR HOSIERY MACHINE.

Special Machines for Sulphur Colors

WILL EARN THEIR COST IN LABOR ALONE IN FROM 6 TO 12 MONTHS ACCORDING TO CAPACITY



SULPHUR SKEIN MACHINE.

DYERS.

Bleacher and Dyer of cotton knit goods. Position wanted by a man 27 years of age, married, English. Has worked on web dyeing and bleaching, also garnet dye and bleaching, aniline black on hosiery. Will not go south. Good reference. 3763, Textile World Record, Boston.

Superintendent of Bleach or Dye Works, or would consider overseer in any department. Worked on sheetings, shirtings, cambrics, lawns, quilts, prints and linens. No knowledge of yarns. 38 years of age. Scotch; married. 1620, Textile World Record.

Overseer of Dyeing. Position wanted by a man, 35 years of age, married, English. Has had a thorough training in chemistry. Has worked on wool, cotton and shoddy raw stock, piece dyes, yarn bleaching, scouring, extracting, etc. Familiar with alizarine colors, all kinds of dyeing and scouring machinery. First class recommendations. 3736, Textile World Record, Boston, Mass.

Overseer of Dyeing. Position wanted by a man 30 years of age, American. Has worked on worsted and cotton yarns, mercerized piece dyes, fast shades on raw stock and slubbing. Is familiar with all kinds of dyeing machinery. Good references. 3592, Textile World Record, Boston, Mass.

Overseer of Dyeing. Position wanted by a man 32 years of age, married. Makes a specialty of fast black on hosiery and yarns, rumble and silk finish, also fancy colors and bleaching. Is familiar with all kinds of machinery used in hosiery and yarn dyeing. Good references. 3559, Textile World Record, Boston, Mass.

Overseer of Dyeing in a woolen mill, or dyeing and finishing in a felt mill. Position wanted by a man 31 years of age, married. Has worked on all kinds of cotton, wool, shoddy mixes, raw stock, yarns cotton and wool, piano felts, chest protectors and hot felts. Good references. Could take position at once. Will go anywhere. 3911, Textile World Record, Boston.

Overseer of Dyeing. Position wanted by a man 48 years of age, American, married. Has worked on raw stock, piece dyes, yarns and blue vats. Worked in some of the leading mills for a number of years. Could take a position at short notice. 3835, Textile World Record, Boston, Mass.

Overseer of Dyeing. Position wanted by a man, 37 years of age, Scotch, married. Has worked on sulphur blacks, indigo, alizarine, warps of fancy shades, raw stock, and skein yarns. Is familiar with Klauder & Weldon and Scotch tubs. Good references. Could take a position at short notice. 3842, Textile World Record, Boston.

Overseer of Dyeing. Position wanted by a man 51 years of age, married, with A-1 references. Worked on stock for Traction and Army goods, Wood and Bisulphate Vats, Natural and Synthetical Indigo, also stock for cassimeres, blankets, robes, shawls, cotton, wool, shoddy mixes, cotton warps, mercerized effects. 3692, Textile World Record.

Dyer. Worked on all classes of goods, woolens, worsteds, yarn, piece dyes, slubbing, blue vats and cotton mixes. An American; married. 3085, Textile World Record.

DESIGNERS.

Designer. Worked on men's wear, woolens and worsteds, overcoatings, broad cloths, ladies' dress goods, worsted piece dyes, thibets and cotton worsteds. Good reference. 28 years of age, married. 4683, Textile World Record, Boston, Mass.

Designer in a Small or assistant in a large mill. Worked on fancy worsteds, cotton worsteds, cassimeres, piece and cross dyes. Familiar with Crompton & Knowles looms. Will not go West, South or Canada. Would prefer a position in Massachusetts, Rhode Island or Connecticut. Good reference. 26 years of age. 4678, Textile World Record, Boston, Mass.

Designer or Assistant Designer. Worked on sateens, fancy goods, lenos and dobby work. Familiar with the different makes of looms. Good reference. 24 years of age. 3252, Textile World Record, Boston, Mass.

MISCELLANEOUS.

Sewing Machine Fixer. Position wanted by a man, 25 years of age, single. Familiar with Wheeler & Wilson, single and double needle, button and buttonhole machines, also Wilcox & Gibbs and Union Special. Will not go West, South or Canada. Good reference. 4573, Textile World Record, Boston, Mass.

Overseer of Beaming, quilling or warp gassing. Position wanted by a man 44 years of age, married, English. Familiar with fancy cotton and silk beaming. Understands all makes of machinery used in the department. Good reference. 4560, Textile World Record, Boston, Mass.

Overseer of Slashing, spooling, warping, drawing and long chain beaming. 42 years of age, widower. Worked on white and colored. Work from 8s to 100s cotton. Familiar with all kinds of machines. Good reference. Will go any place for a good position. 4572, Textile World Record, Boston, Mass.

Comber Setter or Second Hand of combing in a cotton mill. Position wanted by a man 24 years of age, single, American. Worked on fine and coarse cotton. Familiar with Whitin, Asa Lee, and Hetherington machines. Will not go to New Jersey, West, or Canada. Good references. 4018 Textile World Record.

Overseer of Combing. Position wanted by a man 27 years of age, married, English. Has worked on men's wear and fancy dress goods. Is familiar with Noble combs of all makes, Crompton, Taylor, Wadsworth, Smith and Prince. Good references. 3617, Textile World Record, Boston, Mass.

Overseer of Seaming. Position wanted by a man 27 years of age, married. Has worked on ladies' cotton hose and all grades of cotton underwear. Is familiar with Willcox & Gibbs, Hepworth, Campbell & Clute stitching, welting, looping, etc., machines. Good references. 3683, Textile World Record, Boston, Mass.

Overseer of Spooling, twisting, winding and reeling in a cotton mill. 36 years of age. Worked on hosiery warp and thread, Sea Island, Egyptian, Peeler and Peruvian and waste yarns. Familiar with the Lowell, Draper, Whitin, Dobson & Barlow, Fales & Jenks and Universal winders. Will not go West or Canada. Good reference. 4580, Textile World Record, Boston, Mass.

Overseer of Spooling, twisting and skein winding. Position wanted by a man 23 years of age, single. Worked on woolens, worsteds and cotton worsteds. Familiar with the Worcester Warp Compressing Company's spoolers, Davis & Furber and Johnson & Bassett machines. Would prefer a position in Mass., R. I., or Conn. Good reference. 4569, Textile World Record, Boston, Mass.

Overseer of Beetling Department. Position wanted by a man, 43 years of age, married, Irish. Has had ten years' experience on cotton goods in this country, twelve years' experience on linen goods in Ireland. Has worked on cotton goods of all counts from 67 by 72 to 96 by 32, also handled all kinds of beetling machines. Will not go South or Canada. Good reference. 3807, Textile World Record, Boston, Mass.

Master Mechanic. 37 years of age, single. Has had experience in cotton mills, bleach and dye works. Understands all kinds of machinery used in the above mills. Understands all kinds of engines and electrical plants. Good reference. 4093, Textile World Record, Boston, Mass.

Second Hand in Knitting Mill. Position wanted by a man 21 years of age, American. Worked on all kinds of goods on latch needle machines. Familiar with the following makes of knitting machines: Nye & Tredick, McMichael & Wildman, Scott & Williams, H. Brinton & Co., Stafford & Holt. Could take a position at two weeks' notice. Good references. 3975 Textile World Record.

Young Man Wants a Position in a Cotton Yarn mill in Fall River or New Bedford. Has had experience in the shipping department and as receiving clerk. Would like a position where he could learn something about raw stock, in the carding or spinning room. Would work for reasonable wages. Good reference. 4524, Textile World Record, Boston, Mass.

"WYANDOTTE"

Wyandotte Textile Soda is first, last and always a textile soda.

Because we seldom suggest any of the minor uses of this soda you are apt to conclude its profitableness to be limited to those we do mention.

Doubtless you have had experience with felt washers, how with use they will glaze over with grease and allow bobbin to slip which renders them practically worthless.

None Genuine except with card bearing this Trade Mark

In Every Package.

What then, throw them away? No—scour them with Wyandotte Textile Soda. Wyandotte works a marvelous change. It liberates the grease and other matter, raises the nap, and all in all, puts them in condition like new. Don't buy new felts. Quickly make the old ones as good as new with Wyandotte Textile Soda.

Write us for further information.

Order from your supply house.

The J. B. Ford Co., Wyandotte, Mich.

Sole Manufacturers

THIS SODA HAS BEEN AWARDED THE HIGHEST PRIZE WHEREVER EXHIBITED.

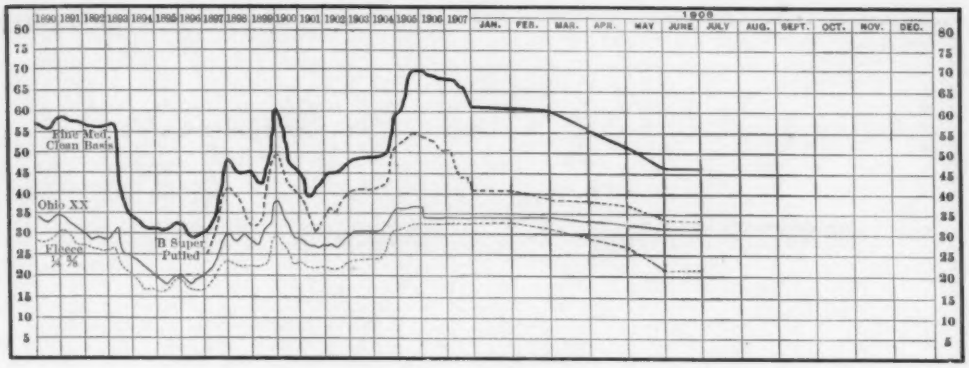


CHART SHOWING RANGES IN THE PRICE OF WOOL TO DATE.

The Wool Market.

Steady prices and a renewed enquiry for wool are generally accepted as indications that the market is at or near the bottom. A glance at our chart shows that the price of fine medium territory has dropped from 70 cents, the high point, to 46 cents. In the past four months this grade has declined from 60 cents. This is going a long ways toward discounting the effect of any political developments, and is certainly enough to meet the general shrinkage in prices during the past nine months.

Buyers are canvassing the market, but are buying sparingly because of the depression in the goods market, which shows no signs of revival. A large part of the present clip is still in the possession of the growers, who have consigned it or left it in the West. The business and political conditions are such as to urge buyers to operate cautiously, and this they will undoubtedly continue to do.

Connecticut, South Coventry. Certificate of incorporation has been filed by the E. A. Tracy Co. with capital stock of $50,000. The object is given as manufacture of woolen goods. Eugene A. Tracy, Frank J. Tracy and Wm. A. Tracy of this place are the incorporators. E. A. Tracy is at present proprietor of a wool extract plant of 9 cards and 5 shoddy pickers. He recently secured a building formerly occupied by the Washburn Silk Co.

Connecticut, Moosup. The Moosup Mills (American Woolen Co.), are preparing to go on full time after a period of curtailment which has extended through a number of months. The other local woolen mills are very busy.

Colorado, Trinidad. Negotiations are pending between J. F. McAfee and C. H. Crosby of Topeka, Kansas, representing a woolen mill, and the local Chamber of Commerce, for locating a woolen manufacturing plant here. The city has offered a site free of cost and representatives are now figuring on a cash bonus. It is given out that it is expected that negotiations will be successful for the location of the plant here.

Delaware, Dover. The Wyoming Yarn Co. has been incorporated with capital stock of $75,000 by G. H. Craven, G. Walker, Jr., and P. F. May of Scranton, Pa.

Maine, Wilton. On account of overproduction, the Wilton Woolen Co. shut down last Saturday for one month.

*New York, Troy. The new Wynantskill Mfg. Co., which as previously reported will mercerize yarns and make knit specialties, is not in the market for machinery at present. They will take over a plant fully equipped.

Oregon, Pendleton. The Pendleton Wool Scouring & Packing Co. started up June 1. The uncertain condition of the wool market is responsible for the late start, but it will not shorten the season's run.

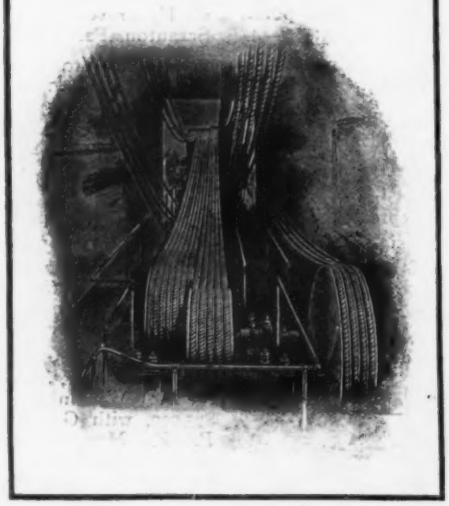
*Pennsylvania, Philadelphia. The Wyoming Yarn Company, which has recently been incorporated at Wilmington, Del., with a capital stock of $75,000, with G. H. Craven, G. Walker, Jr., and P. F. May, of Scranton, Pa., as incorporators will, as has already been reported by us, be located in Wilkesbarre, Pa., having secured a building on River St., formerly occupied by a manufacturer of furniture, which they have fitted up for mercerizing yarns and expect to have in operation some time during the months of April or May. G. H. Craven was formerly connected with the Scranton Yarn Finishing Co., which is now out of existence.

*Rhode Island, Bristol. A new company is in process of organization which will take over the property now known as the Namquit Worsted Mills, on or about July 1. A name for the new company has not yet been decided upon. M. T. Rubenstein and J. L. Rubenstein, of Lewis Rubenstein & Co., 349 Broadway, selling agents of woolens and worsteds, will own considerable stock in the new company. A new dye house is now in process of erection.

Don't let the dollars slip away

use

Plymouth Rope Drives



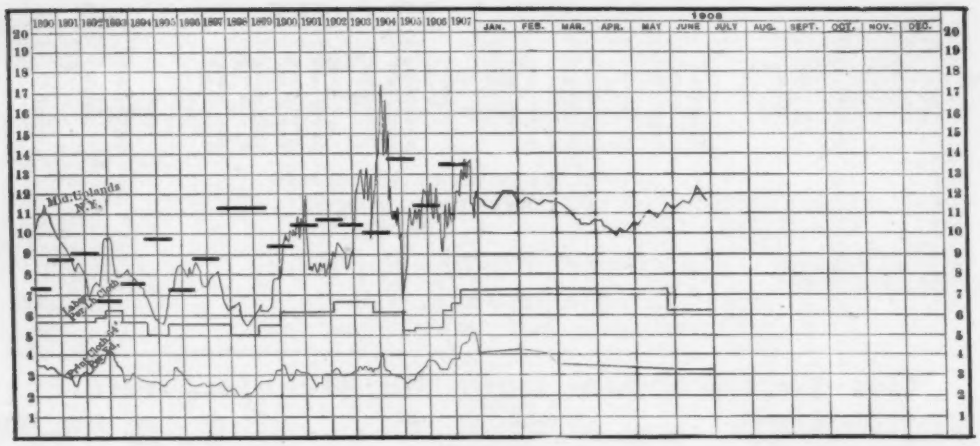
Cost less to install

Cost less to maintain

The absence of slip, freedom from electrical disturbances, great steadiness, the ease with which power can be transmitted in any direction for short or long distances, the economy of space, (pulleys require 100 to 150% more room than rope sheaves per horse power transmitted) wonderful strength and great durability of "Plymouth" Rope Drives especially fit them for use in textile mills.

Send for book on Rope Driving.

Plymouth Cordage Co., North Plymouth Mass. U. S. A.



The short, heavy, horizontal lines indicate the size of the cotton crops in millions of bales.
CHART SHOWING RANGE IN THE PRICE OF COTTON TO DATE.

The Cotton Market.

Our chart shows the result of an attempt by speculators to put prices up during the past month. This attempt was prompted by a knowledge of the fact that the world's stock of cotton is running low. The visible supply on June 26, as estimated by the Chronicle, was 2,712,702 bales, and in the following this stock is compared with the visible supply on the same date for the preceding five years:

1903	2,262,653 bales.
1904	2,074,931 bales.
1905	3,436,233 bales.
1906	3,098,081 bales.
1907	3,608,793 bales.
1908	2,712,702 bales.

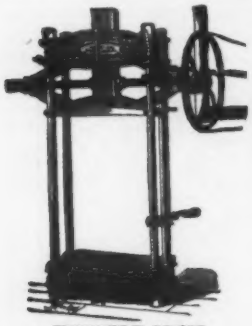
The stock this year is only 700,000 bales more than on the same date in 1904, the Sully year, when mills in all parts of the world were forced to run short time because of the scarcity. This year, however, the situation is altered by the depression in the goods market. When the increased spinning capacity of the world's mills is taken into consideration the present visible stock is no greater than in 1904. Now, however, the mills are facing a declining market for goods. Manufacturers have for three years enjoyed a phenomenal prosperity, which in Europe particularly has been due to the low stock of manufactured goods resulting from the forced short time of 1904. With this experience so fresh in their minds they are ready now to adopt voluntarily a short time schedule, which in 1904 they looked upon as a calamity.

The recent decline in the price of cotton has been brought about by the curtailment of consumption and by the prospects of a large crop. The size of the crop, however, is far from being assured. The course of prices will be regulated by the developments in the goods market and in the cotton fields. Speculators are not likely to undertake manipulation of the cotton market while the situation at both extremes has become more settled.

The movement into sight from Sept. 1 to June 26 is estimated by the Chronicle for a series of years as follows:

1902-03, July 3	10,450,495 bales.
1903-04, July 1	9,842,043 bales.
1904-05, June 30	12,640,041 bales.
1905-06, June 29	10,574,623 bales.
1906-07, June 28	12,965,014 bales.
1907-08, June 26	10,856,014 bales.

WEIMAR BROS.
MANUFACTURERS OF
Cotton Mercerized Tapes,
SPOOL TAPES, BINDINGS AND NARROW FABRICS FOR UNDERWEAR AND OTHER TRADES.
Phone Connections.
Works, 2046-48 Amber Street, PHILADELPHIA, PA.



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BOOMER & BOSCHERT

BALING PRESSES

ARE THE STANDARD

Hydraulic or Knuckle Joint
Any Size .. Any Power

Boomer & Boschert Press Co.

338 West Water S., SYRACUSE, N. Y.
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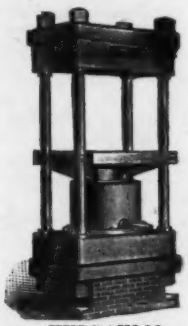


HYDRAULIC.

Get Your Supplies from the Manufacturers.

EXCELSIOR WOOL OIL COMPOUND AND COTTON SOFTENER

Established 1841

Burckhardt & Co.

Cincinnati, O.

The Excelsior Compounds are the best lubricating and softening products for wool, cotton, wool and cotton mixed. Eliminates the scouring process and effects large saving in time and soap. They will not gum in the cards.
Write for prices and particulars.

OLIVE OIL TALLOW SOAP

LARD OIL

Handles heavy cases in a Time-Saving Way—The Economy Steel Tiering Machine

Goods are put in place with ease and economy. The largest amount of stock can be stored in the smallest possible space and yet be instantly accessible. In use in representative mills. Investigate its merits and 'twill be in use in yours. Write for prices.

Economy Engineering Co. 58-64 N. Jefferson St. Chicago, Ill.

LOOK! THE BRANDEN RUBBER PUMP VALVE
Will Outlast Three Ordinary Valves.

Made for hot or cold water or any fluid where rubber valves are used. By its construction will outlast several ordinary valves. A trial will demonstrate the truth of our statements.

JOHNSTONE BLOW-OFF VALVE. A most durable and useful valve.

Pressure and Vacuum Gages. Pop Safety Valves.
Steam Engine Indicators. Whistles, Lubricators, Etc., Etc.

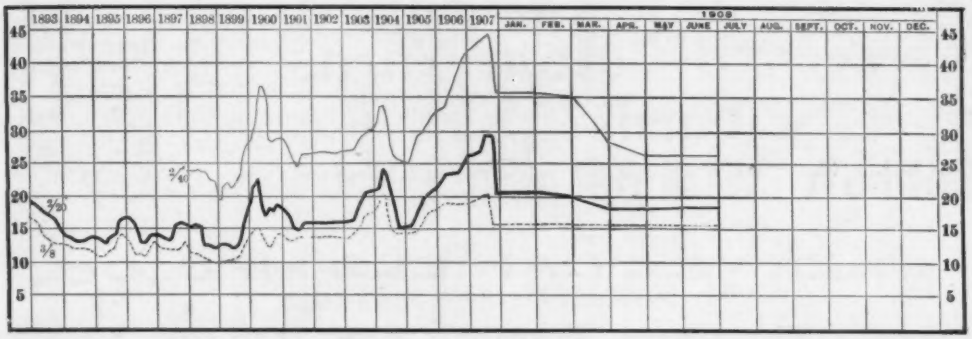
CROSBY STEAM APPLIANCES ARE UNEXCELLED.

CROSBY STEAM GAGE AND VALVE CO.,

Stores: Boston, New York, Chicago, London.

Office and Works: BOSTON, MASS.

Yarn Department.



GRAPHIC CHART SHOWING RANGE IN THE PRICE OF COTTON YARN TO DATE.

The Cotton Yarn Market.

The cotton market during the past few weeks has been in very strong hands, and price has been advancing steadily until good grades are being quoted at 13 to 13 1/2c. and ordinary grades of cotton are being held at 12 1/4 to 12 1/2c. This, however, seems to be a purely speculative movement, as business conditions, judging from the consumption of cotton yarn, do not warrant any advance in cotton. There is a large number of the mills in the South that are shut down entirely or running on greatly reduced time. The same conditions exist throughout the entire trade in weaving and knitting, and mills running full time today are the exception rather than the rule. On account of the small demand for yarn, it has been impossible to get an adequate advance in the price.

We are apparently going to have a dull summer in the textile trade. Prices quoted are nominal, as there is a wide difference in the market on the same number of yarn between quotations made by mills and by commission houses with yarn in stock, and by mills that do not have stock.

Eastern Cops.

6s	18¾
8s	19¼
10s	19¾
14s	20¾
16s	21¼
18s	21¾
20s	22¼
22s	22¾
24s	23¼
26s	23¾
30s	24½
34s	25
36s	26
40s	27

On cones, ¾c. more up to 14s; 1c. more from 15s to 22s; 1 1½c. from 23s to 35s, and 2c. above that.

Eastern Two-Ply Skeins, Carded Peeler.

12s	21
14s	21½
18s	23
20s	24
24s	24½
26s	25
30s	26
36s	29
40s	30
45s	34
50s	41
55s	46
60s	50

Eastern Two-Ply Warps, Carded Peeler.

2/30s	26
2/36s	29
2/40s	30
2/45s	34
2/50s	41
2/60s	50

Egyptian Weaving Yarns.

Single Skeins Combed.

30s	36
36s	37½
40s	38½
45s	40
50s	46
55s	49
60s	53
70s	58

The Philadelphia Market.

Southern frame spun cones:—

7s and coarser	18
8s and 9s	18½
10s	19

THE J. R. MONTGOMERY CO.,

Windsor Locks, Conn.

MANUFACTURERS OF

Mercerized Cotton Yarns Gives the High Silk-Like Lustre in Knit Goods and Woven Fabrics.

Novelty Yarns Boucle, Bourette and Spirals, in Cotton, Wool, Worsted, Mohair and Silk.

Cotton Warps on Beams, Jack Spools and Tubes. In Fancy, Twist, Colors and Printed.

GREENE & DANIELS MFG. CO.,

COMBED, CARDED AND GASSED

Yarns, Threads, Twines and Chain Warps.

DYE SULPHUR BLACKS DIRECT IN COPS, CONES OR TUBES.

Colored and Bleached Yarns Furnished in any manner desired by the trade.

Pawtucket, R. I.

MONUMENT MILLS,

Manufacturers of

White, Colored, Fancy and Double Twist

COTTON WARPS

HOUSATONIC, MASS. 4s to 60s.

THESE MULES CANNOT BREAK THE BANDING —MADE BY—

M. J. TOOHEY & CO., OF FALL RIVER, MASS.

Banding made from Egyptian or White Cotton Yarn as Desired.

The Other Fellows Banding.

The Merwin Paper Company

Hartford, Conn.

Press Papers and Fender Boards

Correspondence Solicited

Mills at Rainbow, Conn. Address Inquiries to Rainbow, Conn.

12s	19½
14s	20
16s	20
18s	20
20s	21
22s	21½
24s	22
26s	22½
30s	23
40s	27
50s	37

Southern high grade mule yarn:—

Cones.

10s	20½
12s	21
14s	21½
16s	22¼
18s	22¾
20s and 22s	23¼-23¾
24s	24

Southern frame yarn, lower grades:—

6s and 8s	17½
10s	18

Eastern cones (high grade quality):—

10s	21½
12s	22
14s	22½
16s	23¼
18s	23¾
20s and 22s	24¼-24¾

Skein yarn (mostly Southern):—

4s and 8s soft	17
10s and 12s	17-18
14s to 20s	18½-19½
22s	20
14/2	18
16/2	18-19
20/2	19-20
30/2	21½-22
40/2	27-28
16/3 slack	19
12/3 slack	18
8/3 carpet	16-17
8/3 slack	16½
9/4 slack	16½

Warps (Southern):—

10s to 12s	17-17½
14s	18-18½
16s	19
20s to 22s	19-20
26s	21
14/2	19
16/2	19½
20/2	20
24/2	21½
30/2	23
40/2	28

Mixed colored yarns (mock twist, half colors):—

6s to 10s	19-20
12s to 14s	20-21
16s to 18s	22-23

Mock Egyptian, 2c. advance over white.

Egyptian, 5 to 6c. above best quality white.

JAMES E. MITCHELL CO., COMMISSION MERCHANTS.
Cotton Yarns
AND COTTON CLOTHS.
122-124 Chestnut Street, PHILADELPHIA, PA.
73 Leonard Street, NEW YORK.
Brown Building, 185 Summer Street, BOSTON, MASS.
25 South Tryon Street, CHARLOTTE, N. C.

CATLIN & CO.,
Cotton Yarns.
345 Broadway, NEW YORK.
67 Chauncy Street, BOSTON.
128-130 Chestnut Street, PHILADELPHIA.
605 Medinah Temple, CHICAGO.

Harding, Whitman & Co.,
Dry Goods Commission Merchants,
COTTON AND WORSTED YARNS.
BOSTON. NEW YORK. PHILA.
CHICAGO. BALTIMORE. ST. LOUIS.

A. D. Salkeld & Bro.
COMMISSION MERCHANTS
DEP'T. FRED'K VIETOR & ACHELIS
COTTON YARNS
66-72 LEONARD STREET - - NEW YORK

Fred Sternberg & Co.
530 Broadway, - NEW YORK.
MERCERIZED TURKEY RED GASSED } COTTON YARNS.

LUDWIG LITTAUER,
SUCCESSOR TO
MOELLER & LITTAUER, 109 Greene St., New York
SILK, WORSTED, WOOLEN YARNS COTTON AND MOHAIR
Polished Threads and Tinsel. Artificial or Wood Silk.
Mercerized, Turkey Red, Fine Gassed Yarns.
SILK MILL, BOONVILLE, N. Y.

High Grade Hosiery Yarn
White and Colors. All Numbers. Sewing Twines on Cones and Tubes
SPECIALTIES IN WEAVING YARN
Black and White. Double and Twist for Woolen Trade.
CANNON MILLS 53-5 Worth Street, New York
Philadelphia Office, 205-7 Chestnut St.

C. MOORE & CO.,
Manufacturers of
TWINES, THREADS AND YARNS
Jacquard Harness Twines of all kinds
on hand and made to order.
S. W. Cor. Fifth and Market Sts., Phila.

S. T. Crocker, Pres. W. F. Stiles, Treas.

ORSWELL MILLS

Fitchburg, Mass.

Capacity, 45,000 Spindles.

HIGH GRADE YARNS

From Egyptian and Peeler Cottons, Carded or Combed, in Chains and Skeins, on Balls, Beams, Spools, Cops, Cones, Tubes, Single or Twisted.

Cotton Yarns

Jenckes Spinning Company
Pawtucket, R. I.

Carded and Combed single and twisted Yarns and Threads from Peeler, Sea Island and Egyptian Cottons, on Cops, Cones and Tubes or in Skeins and Warps. Six Cord Thread Yarns a Specialty **Bleached or in colors**

GRANT YARN CO.,

COMBED AND CARDED COTTON.

YARNS 40's and above. AND
FITCHBURG, MASS. **WARPS**

F. W. MAURER & SONS CO.

MANUFACTURERS OF

TAPES, BINDINGS, NARROW FABRICS AND EDGINGS FOR NOVELTY CURTAINS

Office, 528 Cherry St. Factories, 529 & 531 Arch St. and 524 Cherry St., and Germantown Ave. & Bristol St.
PHILADELPHIA

Hoffman, DeWitt & McDonough Co., Inc.

Diamond Stay Bindings
TRADE MARK

Manufacturers of
Tapes, Webbing and Bindings.

COTTMAN and G STS., PHILADELPHIA
CHELTENHAM, PENNA.
Bell Telephone, 235-D Cheltenham

Simplex Yarn Tables.

Showing equivalent sizes of different systems of numbering yarn; cotton, woolen, worsted, etc., so that the sizes of different standards may be quickly compared. Also contains a number of other valuable yarn tables for designers, manufacturers and knitters. PRICE 50c. Textile World Record, Boston.

Something New

EQUIVALENTS AND YARN TABLES

Cotton, Woolen, Worsted, Silk, etc.

Price 50 Cents.

NEW YORK SILK CONDITIONING WORKS
138, 140, 142 Spring St., New York

Ballou Yarn Co.

PROVIDENCE, R. I.

Harness and Seine Twines and other Job Gassing, Winding, etc. All Numbers

GASSED YARN SPECIALTIES

C. M. BLAISDELL, Pres. and Treas. G. A. BLAISDELL, Vice-Pres. and Sec'y.
Established 1860—Incorporated 1893.

THE S. BLAISDELL, JR., CO.,

COTTON, EGYPTIAN PERUVIAN

American Long Staple a Specialty. Shipments direct to mill from Egypt, Peru and all American Southern Points.

CHICOPEE, MASS.

Cotton Waste Purchased on Yearly Contract from Mills.

Reels for Cotton WOOLEN AND WORSTED

Patented Hosiery Winders, Cop Winders and Spoolers.

LINDSAY, HYDE & CO.,
2124 to 2130 East York St., PHILADELPHIA, PA.

Lowell Crayons Meet the requirements of any cotton, woolen or worsted mill.

May we send samples? 15 colors and white.

Lowell Crayon Co., Original Manufacturers Lowell, Mass.

Trade Mark on every box.

Woolen and Worsted Yarn Market.

Spinners of worsted yarn report that the firmness of the wool market has led them to ask for better prices than have prevailed within the past few weeks. Manufacturers are asking for samples on Bradford spun yarn from 2/20s to 2/36s, and in many instances the spinners are accepting orders from the buyers when they can sell the yarn at a profit. French spun yarn manufacturers are holding back and waiting for fall orders, and at the present time, are refusing orders at the old rates, claiming that when the business does open up and the manufacturers come into the market for yarns the prices are bound to go up.

The underwear trade still continues quiet and very few orders are being received. The sweater and fancy knit goods manufacturers are very busy, the demand from this quarter being for oxfords and a good grade of whites. These people, it is said, are using a better grade of yarn than ever before. Business from the East has improved and a good business is now coming from that end, but there seems to be little disposition on the part of the knitters to make up stocks in advance as they do not want to anticipate the wants of the trade.

The demand for woolen yarns is for whites and oxford mixes containing different percentages of cotton, with some asking for all wool, the prices ranging from 40 to 60 cents, according to the quality of the yarn wanted. Spinners of these yarns report that business is now a little better than it has been for some time past.

Men's wear manufacturers report that for the past week there has been a let-up in duplicate orders for fall goods, it being the impression that the manufacturers are waiting for the retailers to place their orders. As a matter of fact, the manufacturers today are buying absolutely nothing unless it is sold. There are a few spring lines being opened up, but with very little success, and the particular request is for reference samples. It would seem, considering the condition of the market, a very poor time in which to open up goods for next spring as the buyers do not seem to know where they are at. Most of the important lines are figuring on opening some time after the Fourth of July, which looks as though they were in time. The inquiry for resists seems to be on in full blast and they are being made in all kinds of fabrics. Pessimistic talk is heard concerning these goods fading, coming up streaky and spotty, which, of course, is a common occurrence when anything new comes out. It seems as though almost all the buyers have some complaint

No amount of adjusting will make an inferior belt do the work of a Rhoads Belt.

Rhoads Leather Belting

is right in the making, and stays right. Side by side with others is the place to find out its value.

J. E. RHOADS & SONS

Philadelphia: 12 N. Third St. New York: 40 Fulton St
Hamblet & Hayes Co., Eastern Agents,
Boston: 105-111 Summer St.
FACTORY and TANNERY, WILMINGTON, DEL.

LINEN YARN IMPORTER.

HUGHES FAWCETT, 115 Franklin Street, NEW YORK.

Flax, Hemp and Jute Line and Tow Yarns,
For Weaving Purposes.
Linen Jacquard Harness Twines,
Fine Cotton Harness and Heddle Twines,
For Cotton, Silk, Woolen and Carpet Manufacturers.
Correspondence solicited. Samples promptly furnished.

DUNCAN & YOUNGS
95 Worth Street, NEW YORK
Practical Manufacturers of
YARNS, THREADS, TWINES, CORDS, ROPE
AND MILL SUPPLIES
Anything in the line you cannot get anywhere else apply to us.

FRANK A. TIERNEY,
TOPS, NOILS, ROVINGS, YARNS.
Wool, Silk, Mohair, Camels Hair, Ramie.
Garnetted Stocks
Silk also Ramie Tops and Noils, Ramie, Silk, and Silk Noil Yarns,
Special Textile Fibres and Novelties.
Wool Exchange Bldg., 260 West Broadway, New York.

MILL CRAYONS OUR SPECIALTY
Made in 15 Colors and White. 2 Grades.
Write for Quotations.
Howe Mill Crayon Co., Lowell, Mass.

Pocasset Worsted Company

WORSTED YARNS

100 Boylston Street, - Boston, Mass.

French System. Bradford System.

B. F. BOYER CO.,

MANUFACTURERS OF

WORSTED AND WOOLEN YARNS,

Office and Mill, River Ave. and Marlton St. CAMDEN, N. J.

KROUT & FITE MANUFACTURING CO.,

Manufacturers of

Silk, Cotton and Mercerized Narrow Fabrics

SPOOL TAPES A SPECIALTY.

Telephone Connection. Office and Mill, Allegheny Ave. and Emerald St., PHILADELPHIA.

WORSTED YARNS

RICHARD CAMPION.

SELLING AGENT FOR

Bristol Worsted Mills,
Highland Worsted Mills.

300 Chestnut Street,
PHILADELPHIA, PA.

EDDY & STREET,

Cotton, Woolen

Yarns and Braids

Worsted, Spun Silk.

PROVIDENCE, R. I.

Beacon Narrow Fabric Co.

Braids & Tapes

Notre Dame St. FALL RIVER, MASS.

Woolen and Merino YARNS

Eaton Rapids Woolen Mills,

EATON RAPIDS, MICH.

Bradford System French System

STEPHENSON & CO.

Worsted and Woolen Yarns

240 Chestnut Street
PHILADELPHIA.

Worsted AND Woolen Yarns

WALTER McCOOK

BELL TELEPHONE LOMBARD 3790

576 Bourse
Philadelphia

Joseph D. Swoyer & Co.,

Manufacturers and Commission Merchants

Woolen, Worsted and Cotton Yarns

HOWARD AND BERKS STREETS,
PHILADELPHIA.

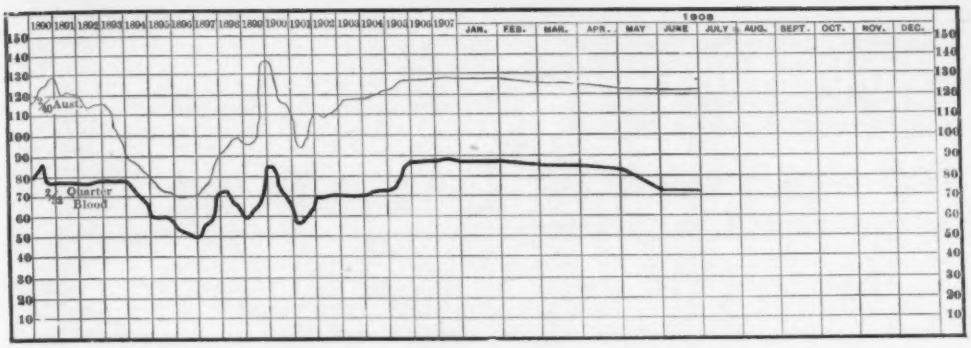


CHART SHOWING RANGES OF PRICE OF WORSTED YARNS.

to offer in reference to these fabrics. When they have been once used and their success proved, the buyers will all fall in line and some will be too late to get their share of the goods.

Rain cloths are moving fairly well, nearly all the business being done on high colors and novelty effects. Some blanket business has been placed, but orders taken under such conditions may or may not be worth noting as the cancellation fever takes hold very liberally in times like these.

The mills are all anxious for business and when duplicates are offered the buyer wants immediate deliveries which, of course, is impossible. It is certainly a trying season. The same old talk about wool goods improving is heard all the while but not many substantial orders are being placed. Of course in certain quarters, such as boys' and children's houses, the wool goods are doing fairly well, but the demand for worsteds, both finished and unfinished, is as good as ever.

Manufacturers of dress goods report that duplicate orders are beginning to come in, most of them being from large houses in the West that have reordered on their original purchases. Some of the mills state that quite a few duplicates have been received. The indications are that, while business for the fall will be late, it will be much better than it has been for the past eight months. The general impression is that there will be a scarcity of goods in all desirable weaves in the early fall, as jobbers state that nearly all goods that have accumulated during the past six months have been laid out and stock goods disposed of, consequently the merchants have been selling their stock and buying only what they think is absolutely necessary for their use and in the smallest quantities. We quote as follows:

2/12 to 2/16 low common	60-62½
2/26 to 2/28 common	67½-70
2/12 to 2/20 1/4 blood	70-72½
2/26 to 2/28 1/4 blood	72½-75
2/32 to 1/4 blood	75-77½
2/20 3/8 blood	82½
2/26 3/8 blood	82½-85
2/30 3/8 blood	85
2/36 3/8 blood	85-87½
2/40 1/2 blood	1.00-1.02½
2/40 delaine	1.12½-1.15
2/50 delaine	1.17½-1.20
2/40 Australian	1.22½-1.25
2/50 Australian	1.27½-1.30
2/60 Australian	1.42½-1.45
2/24 lustre	85
2/28 lustre	87½
2/30 and 3/32 lustre	90-92½
2/36 lustre	97½-1.00
1/24 worsted and 80s single cotton for raincloths	1.00-1.05
1/24 worsted and 120 single cotton for raincloths	1.15-1.20

FRENCH SPUN YARN.

1/20 1/4 blood	78-80
1/20 high 1/4	85-87
1/20 3/8 blood	92½-95
1/20 1/2 blood	92½-1.00
1/20 high 3/8	90-92½
1/30 high 1/4 blood	87½-90
1/30 3/8 blood	92½-95
1/30 1/2 blood	1.00-1.05
1/40 1/2 blood	1.05-1.07
1/50 delaine	1.20-1.22
1/40 Australian	1.25-1.30
1/50 Australian	1.30-1.35
1/60 Australian	1.40-1.45
1/70 Australian	1.45-1.50

*Connecticut, Mystic. It is expected that the new mill being erected at Industrial Place will be completed and machinery installed by the Ninigret Mills Co. by Sept. 15. As previously stated, this company will install 100 looms for manufacturing silk, and silk and cotton goods. The capital stock is $100,000. Otho O'Sullivan of Stonington is president and agent, G. W. Mansfield is treasurer and A. F. L. Ledwidge is superintendent. They would like information on electric motors, employees' time recorders, second-hand hydro-extractor, warping and beaming machinery and watchman's clocks.

TRADE MARK REGISTERED IN
NON-FLUID OILS
UNITED STATES PATENT OFFICE

It is friction—not work—that wears out machinery

Perhaps you never thought of it that way before. Friction is simply lack of sufficient lubrication.

Grease isn't a wholly good lubricant because it demands frictional heat to soften it before it even begins to lubricate.

Logically and practically Non-Fluid Oils—"the oils which do not drip"—deserve their widespread recognition as the best known solution of the problem of cleanly, efficient and wholly economical lubrication.

Write for free samples.

ORIGINATORS AND SOLE MANUFACTURERS

New York & New Jersey Lubricant Co.
Dept. H
14-16 Church St., New York City.

43-e

William B. Charles,
Amsterdam, N. Y.
Cotton Yarns, Cotton Cloth, Silesia, Sateens,
For the Underwear Trade.

Knitting and Weaving YARNS.

Cones, Cops, Warps, Skeins,
Single, Double, Three-Ply, etc.
Peeler, Egyptian, Mixed Colors.
Large Assortment.

EDWARD S. HYDE,
226 CHESTNUT STREET,
Philadelphia, Pa.

The Rag and Shoddy Market.

The mills are buying very little stock, as a large part of the spinning machinery is idle. Dealers in rags and shoddy are, however, continuing to meet this situation by keeping stocks down. The supply of rags depends largely on the industry of collectors. This supply is very elastic and capable of quick expansion or contraction to meet the demand. This accounts for the steadiness of prices during the long period when fashion and more recently business depression has restricted the demand for wool substitutes. We quote as follows:

SHODDIES AND EXTRACTS.

White yarn, best all wool	43-48
White knit, all wool, best fine	30-40½
White knit, No. 2	30-38
Light yarn, extra fine	31-33
New pure indigo blue	30-33

Merino.

Fine light, all wool	25-26½
Medium light, all wool	16½-18
Fine black, all wool	26½-30
Fine dark, all wool, best grade	20-22½
Medium dark, all wool, No. 2	15-17½
Red knit stock, strictly all wool	21-22
Red flannel, all wool	
Dark blue for hosiery, strictly all wool, No. 1	20-23½
Dark blue for hosiery, not all wool, No. 2.	15-18

WOOLEN RAGS.

Fine merchant tailors	10-13
Choice light colors	15-17½
Browns	12-14½
Blacks	10-13
Fine blues, plain	9-12
Fine dark	10-13
Medium dark	6-9

Worsteds.

Blue	14-18
Black	20½-22

Serges.

New black	15-17
New blue	

Flannels.

New scarlet	19-20
New blue	15-18½
Cloakings	3-7

SOFTS AND KNIT STOCK.

Soft woolens, best	6-7½
Old white flannels	20-23
Old red flannels	12-16½
Old blue flannels	8-10
Old plaids	8-9½
White stockings	20-22
White hood stock	20-23
Clear hoods	9-12

CHENEY BROTHERS

Silk Manufacturers. So. Manchester, Conn.

Trams, Organzine and Spun Silks in the hank, or on spools and cones for woolen manufacturers.

Silks for electrical uses, insulation and special purposes made to order.

Knitting Silks, Ribbons and Piece Goods for Trimming Knit Goods.

Dress Silks, Satins, Linings, Printed Pongees, Foulards and Decorative Silks; Upholstery Goods, Ribbons, Sashes, Plushes and Velvets.

WILLIAM RYLE & CO.,

Foreign and Domestic

Spun Silk Yarns and Noils.

Domestic Thrown Silk of every description. Fine Pure Dye Silks for the woolen trade a specialty. Importers of European and Asiatic Raw Silk.

54 Howard St., cor. Mercer St., NEW YORK.

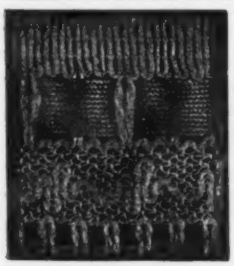
SAUQUOIT SILK MFG. CO.,

INSULATING AND BRAIDING SILKS.

ORGANZINE, TRAM & HOSIERY SILKS.

Fast Dye Organzines for Woolen Manufacturers a Specialty.

Mills: Bethlehem, Pa., Phila., Pa., Scranton, Pa. New York Representatives, Wm. Ryle & Co., 54 Howard St.—Phila. Office, 4015 Clarissa St., Nicetown.—Chicago Office, 188-190 Market St.—Boston Office, 78 Chauncy St.



GEORGE W. CHAPIN,

BRAIDS Cotton, Worsted, Mercerized, Cotton and Silk Twilled. **TAPES** Common, Twilled, Superfine and Plain 13 to 35s, white and colors on spools.

YARNS Cops, Skeins, Warps, Tubes and Cones. **THREADS** on Spools, Tubes, Cones, Unbleached Bleached and Colors for Manufacturers' use.

CROCHET LACE EDGINGS Latest Styles in Pant Laces.

229 Church Street 231 . . PHILADELPHIA

Dyestuffs and Chemicals.

Acids.

Acetic, 100 lbs.	2.60-3.25
Citric, domestic	50-51
Oxalic	8-8½
Sulphuric, 66°, 100 lbs.	1.25-1.85
Muriatic, 18°	1.12-1.75
Tartaric crystals	26-30

Miscellaneous Chemicals and Dyestuffs.

Acetate of lime, gray, 100 lbs.	2.55-2.85
Alum, lump	1.72-2.50
ground	1.80-2.25
powdered	2.80-3.30
Aqua ammonia, 26°	4½-6
Ammoniac, sal., gray	68
Borax, bbls.	4½-7½
Brimstone, crude, ton	23-50½
Copperas	64-83
Cream tartar, crystals	20½-25
Fuller's earth, powdered, ton	18-20
Glauber's salt	50½-65½
Potash, chlorate, crystals	11-12½
powdered	10½-12
carbonate	4½-6
Soda, bicarbonate	1.62-1.76
Soda, caustic, domestic, 60 per cent.	1.73-1.90
Sal., American	70-83
Vitriol, blue	5-6½
Acetate of soda	4½-6½
Acid, picric, best crystals	27½-29
tannic, commercial	32-43
Albumen, egg	60-72
blood	25-34
Alizarine, red	18
Aniline, oil	12½-14
salt crystals	14
Bichromate of potash, American	10-10½
Bichromate of soda	7½-8
Bisulphite of soda	2¼-4
Cutch, mat	5-6½
Dextrine, imported potato	6-9
Divi-divi, ton	45.00-68.00

*Rhode Island, Washington. At a meeting of the management of the Livingstone Worsted Co. and a committee of the striking weavers, a compromise was arranged and the strike declared off. The Livingstone Co. has just completed a new addition in which 10 Crompton & Knowles looms will be set up.

*Rhode Island, Woonsocket. Work has started on the addition to the Lowland Worsted Co., formerly the Loridan Worsted Co. The new structure will be 150 by 75 ft., 2 stories high, with basement. Ambrose Feeley is general manager and treasurer of the company, Alphonse Gaulin is president and George J. Warfield is secretary. French spun worsted yarns are manufactured.

Wisconsin, Sheboygan Falls. The Brickner Woolen Mills are making a number of improvements, including the addition of a quantity of new machinery. E. D. Anderson of Chicago, Ill., is selling agent for this concern.

EDWIN F. SCHOFIELD
ALL GRADES
PULLED AND FLEECE WOOLS
FOREIGN NOILS, CARPET WOOLS.
COTTON WASTE.
45 SOUTH 3RD STREET,
Philadelphia, Pa.

JOSEPH M. ADAMS CO.
WOOLEN YARNS,
Carpet Backing and Rug Yarns a Specialty.
ARCOLA MILLS,
Main St., foot of Centre St., Manayunk, Philadelphia.

William B. Charles,
Amsterdam, N. Y., U. S. A.
Cotton and Wool Wastes
COTTON YARNS
Contracts made with Cotton and Woolen Mills for Yearly Waste Production. Correspondence solicited. Shepperson's Code, 1878. Cable Address "Charles."

SHODDY
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SPRINGFIELD, VT.
Established 1871
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Chemische Aniline Works
Manufacturers of
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New York

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The HOME INSURANCE COMPANY NEW YORK

Organized 1853. MAIN OFFICES, 56 CEDAR ST.

Cash Capital, $3,000,000.

ASSETS January 1st, 1908	$20,862,698
LIABILITIES (Including Capital)	13,659,487
RESERVE AS A CONFLAGRATION SURPLUS	500,000
NET SURPLUS OVER ALL LIABILITIES AND RESERVES	6,703,211
Surplus as Regards Policy-holders	10,203,211
Losses Paid Since Organization Over	110,000,000

Note amount of surplus after providing for San Francisco and other conflagrations.

HOME Policyholders everywhere have protection, which is sure, notwithstanding conflagrations anywhere.

IS prepared to entertain liberal lines on Sprinkler-Equipped and Modern Improved risks generally, having a special department for the consideration of such business.

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FREDERICK C. BUSWELL, Vice-Pres. CHARLES L. TYNER, Secretary.
CLARENCE A. LUDLUM, Asst. Sec'y. HENRY J. FERRIS, Asst. Secretary.

Connecticut, Willimantic. The Holland Mfg. Co. will erect a large and modern store house in the mill yard. The building will be of fireproof construction of brick and steel.

Illinois, Rockford. A large glove and mitten industry will be started up by Joseph Armbuster, and equipment consisting of a number of sewing machines will be required.

*Maine, Alfred. The new Alfred Embroidery Co., capital stock $100,000, has purchased the Littlefield Mill for the sum of $4,000. It is expected that work will be begun as soon as machinery arrives.

Massachusetts, Hopkinton. Manufacturing has been suspended in the Hermina Silk Mill, which is a branch of R. & H. Simon of Union Hill, N. J. and Easton, Pa. It is not known how long the plant will be shut down.

New York, Corning. Manufacturing has been resumed by the Merrill Silk Co., orders having come from the main plant at Hornell to start up the mill. Silk gloves are manufactured.

Pennsylvania, Philadelphia. L. R. Woodhead, 1728 Phillip St., manufacturer of upholstery goods operating 14 looms, has shut down the plant and will not start it up again.

Pennsylvania, Philadelphia. The Oldham Mills, Allegheny Ave. and Boudinot St., manufacturers of upholstery goods on 200 looms have been shut down. It is not known whether it will be started up again or not.

Connecticut, Norwich. The Reliance Worsted Co. has orders enough ahead to run its mill day and night for a number of months, and if help can be secured, the plant will be run overtime. This company manufactures woolen and worsted goods on eight sets and 64 looms. It also owns the Preston Woolen Co., and the latter plant manufactures yarn which is sold to the Reliance Co.

*Massachusetts, Fitchburg. At the annual meeting of the Houghton Web Co. the stockholders voted to issue $10,000 more common stock and appointed a committee to get estimates on building an additional weave-shed. The company has orders to fill which require the enlargement of the present plant. The Houghton Web Co. started manufacturing early this year in the building formerly occupied by the Fitchburg Steel Ball Co. Elastic and non-elastic webbing is manufactured. The capital stock is $50,000 and G. K. Hudson is president, I. S. Houghton, treasurer and general manager, and W. G. Hayes, clerk.

*Massachusetts, North Dighton. It is stated that a number of small orders have been received by the Chadwick Print Works and as business is improving rapidly it is probable that this company will finally start manufacturing shortly.

Nebraska, Ralston. It seems probable that this place will be selected by the Star Knitting Works of Grand Rapids, Mich., for a branch plant. M. S. Walker, son of Samuel S. Walker, president and manager of the Star Knitting Works, is in the city looking over available sites.

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Turkish Towels Made Up to Suit the Trade and Shipped to Any Point

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SPECIAL ATTENTION IS GIVEN TO THE REDYEING OF ABOVE

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Fast colors on Wool and Cotton. **Sulphur Blacks on Cotton (Raw Stock)**

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Sheetings, Shirtings, Lawns, India Linons. Everything in White Goods.

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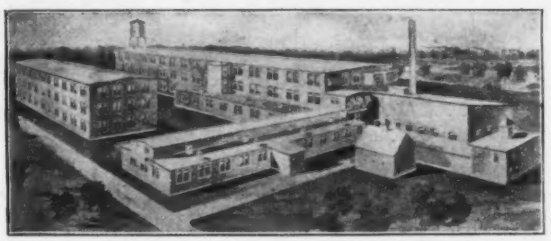

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in skein, and long and short

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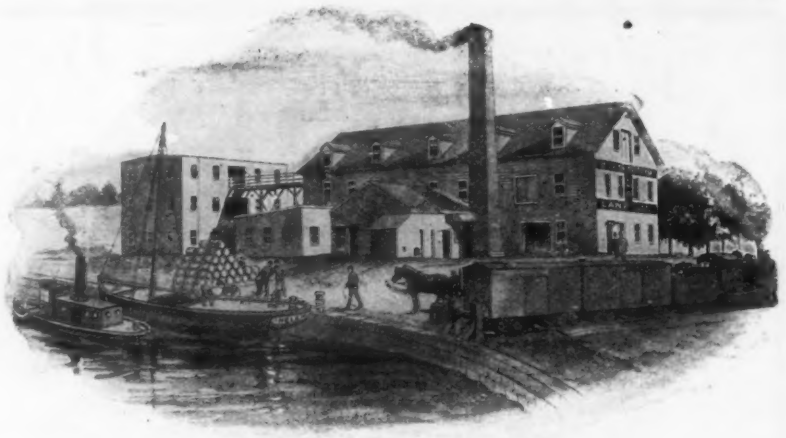

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CELLULINE—For cotton warps
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from standpoint of economy as well as quality of fabric.

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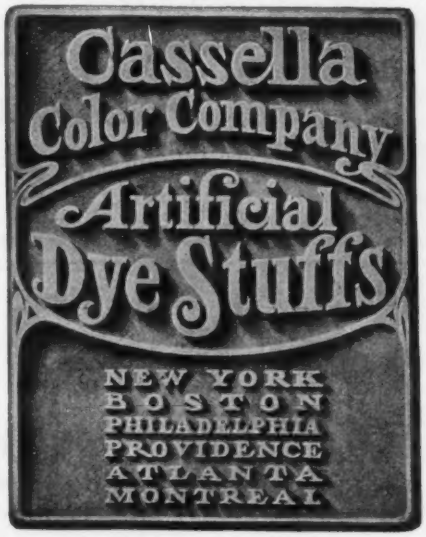

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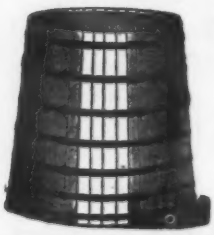

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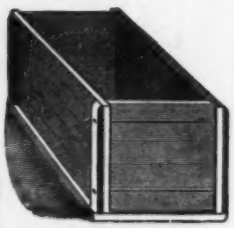

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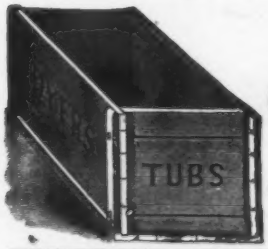

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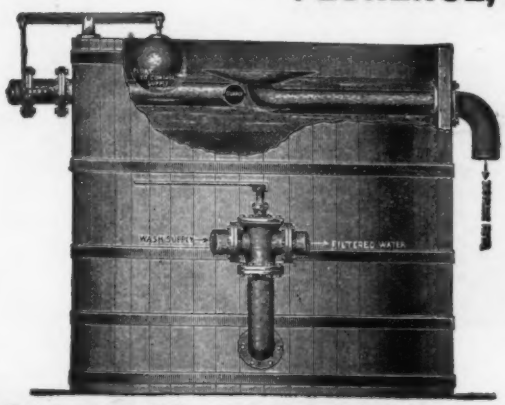

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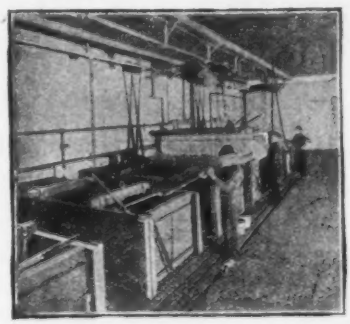

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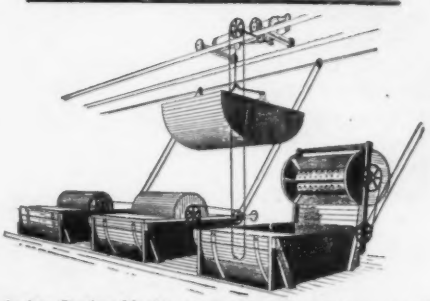

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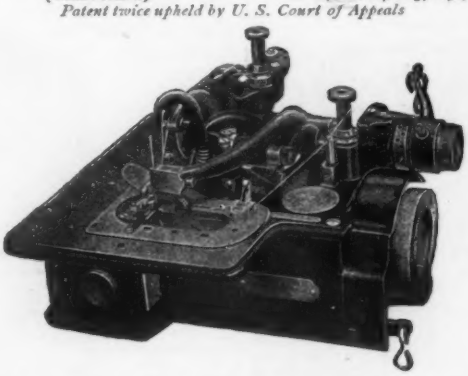

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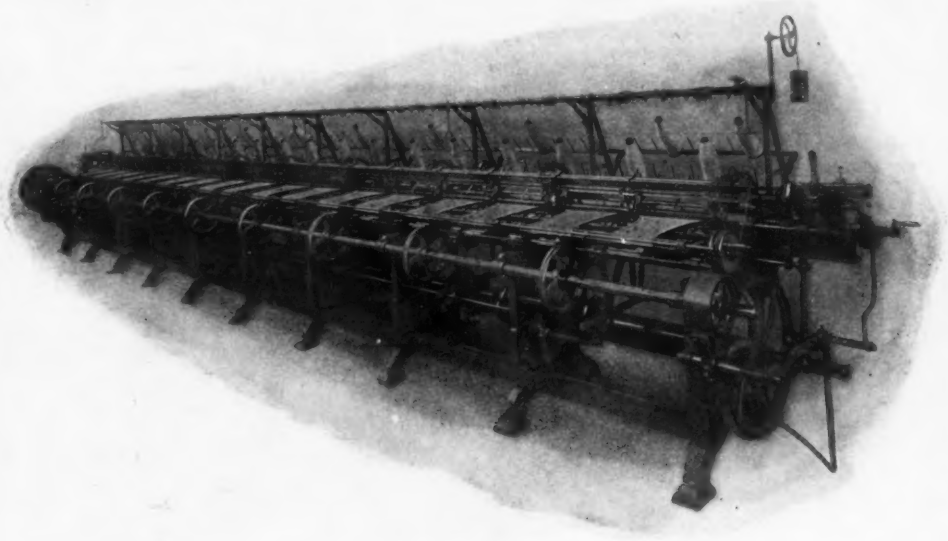

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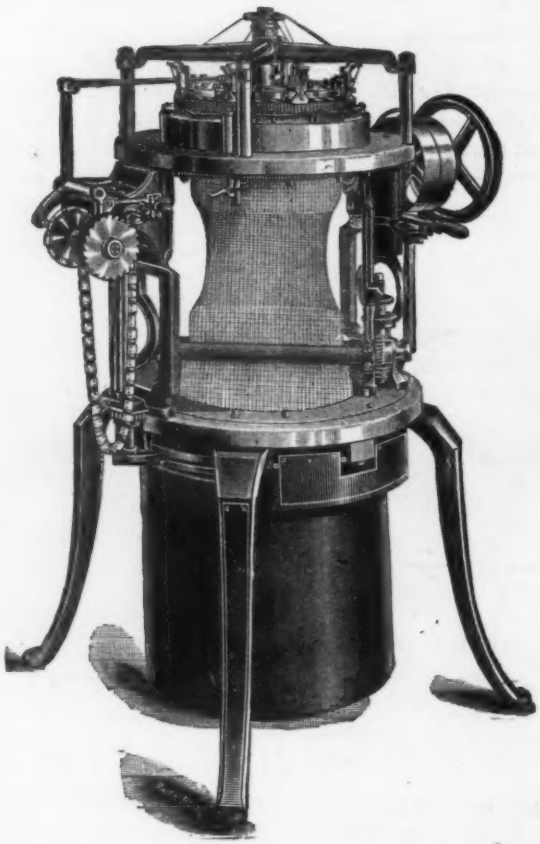

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AUTOMATIC AND PLAIN

For all classes of Ribbed Hosiery, Underwear, Combination Suits, Sweaters, Etc.

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All Special Machines for Any Article That Is Knit

Full Fashioned Hosiery Machines

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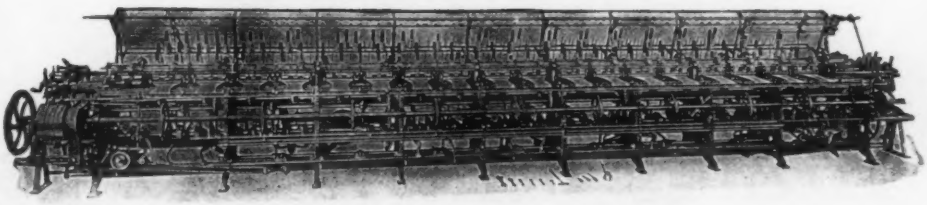

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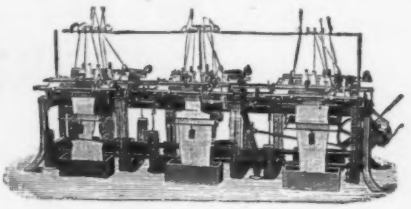
GROSSER Flat Knitting Machines
For HAND Power or FULLY AUTOMATIC Power MACHINES. Most productive and best machines for Sweaters, Jackets, Blouses, Wool Hosiery, Gloves, Mittens, Sporting Goods in Plain, Fancy and Jacquard Work, Shaker Articles, etc. Large stock on hand. Power Machines to be seen in operation.



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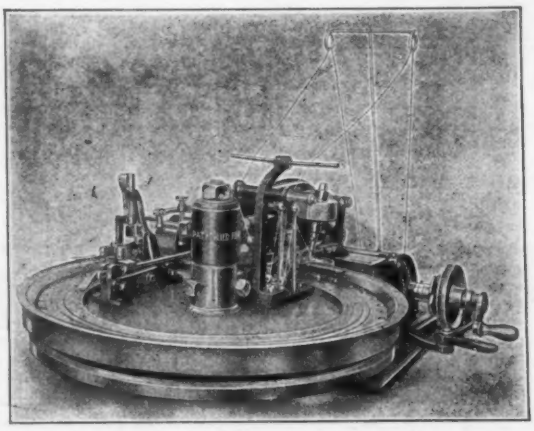
C. Terrot Söhne, Cannstatt, Würt, famous builders of the best Circular Frame for Finest Underwear, Fleece Linings, Gloves, Special á-jour (openwork) Fabrics, etc.

RASHEL MACHINES [Double Rip Warp Knitting Machines.]
For Fancy Goods in largest variety, Shawls, Capes, Caps, Borders, Fringes, Lace Work, etc., in silk, wool cotton.



The LOOPER THAT LOOPS!
Two thread lock stitch machine with reliable trimmer and raveller producing *indistructible, flat elastic* seam.
No Hosiery or Underwear plant up to date without this machine.

DIAMOND OVERSEAMERS
for all classes of selvege goods, Full Fashioned Hosiery, Underwear, etc.

FINISHING MACHINES for Knit Goods of all styles.

WINDERS for finest yarns.

Information, Samples and Specifications at Your Disposition

FRIEDBERGER-AARON MFG. CO.

Leading Manufacturers

Braids and Edgings

For Trimming

Ladies' Ribbed Underwear.

Having Installed More New Machinery and **Increased Our Facilities** in general, we are in better position than ever to sustain our **Established Reputation.**

Mills: Germantown, Philadelphia

P. O. Address, Logan Station, Philadelphia.

Higher Speed

To Reduce Cost of Production by Increasing Output of Operators

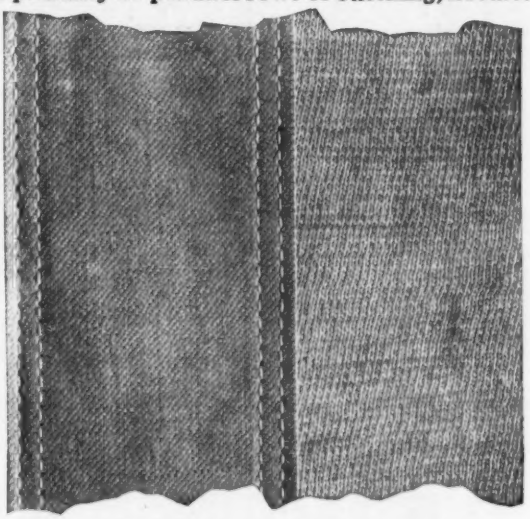
Higher Efficiency

USE

Multiple Needle Single Thread Stitching Machines

For all Multiple Needle Operations, whether for Ornament or for Service, where it is desired to have a plurality of parallel rows of stitching, needles spaced as desired

Yielding Bottom Presser Foot to be used where different thicknesses of Fabric are being Stitched Simultaneously



Special Fittings and Attachments now ready for Numerous Manifold Operations

Greater Simplicity

Style 16100 A-4 Needles-8-80-8 Gauge
Stitching Front Facings to Undershirts
One Operation

Greater Durability

Union Special Machine Company

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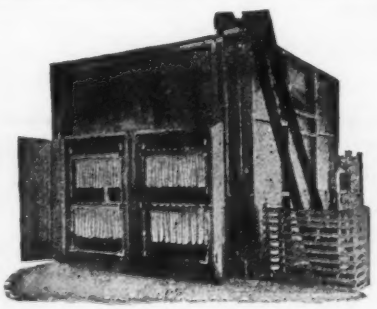

Bailey's Hot Air System of Yarn Drying has no equal

where large capacity is required. Leaves the yarn in fine condition for winding and weaving, makes little waste, is simple and very effective. My *cold air system* is unequalled where output is not *the* all important thing.

Write for particulars.

Dye Sticks, Dye Poles, Wood Rolls, Fans and Trucks.

FRANK BAILEY, Manufacturer, Works at Braddock.
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ALL KINDS OF NEW AND SECOND HAND **KNITTING MACHINERY**

A RARE OPPORTUNITY TO BUY.

60 Lamb and Grosser sweater machines.
30 Standard "B" 3¼" Knitters, 200 Needles.
20 " "B" 3¾x4" " 188 "
54 " "B" Knitters for sizes.
24 Mayo "Acme" " " "
14 National Knitters, 3¾ in., 216 needles.
7 " " 3½ " 200 "
60 Lamb & German flat machines.
2 Double Ribb machines
7 Latest Improved Necktie machines.
1 Crane Style Collarette Machine 20" 16 to in.
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1 Cornely Hosiery Embroidery Machine.
500 Dozen hosiery shaping boards.
1 Caligraph Typewriter
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1 Singer Nat. Button-hole machine.
500 Payne Winder Bobbins.
100 ¾ Aut. Knitters, various makes and sizes.
1 Payne 48 Spindle Cop Winder.
4 Abel 36 " " "
1 Huse 30 " " "
1 Uhlinger 42 in. Extractor, friction driven.
1 Cleveland 42 in. " belt "
1 Merrow Shell Crochet No. 35 B.
1 Crawford 21 plate Press 31 x 44 (hollow plate, screw press).
1 Pownall Screw Press 34 x 52 in.
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5 Band folding and cutting machines.
1 Curtis & Marble Napper, 66 in.
1 McCreary Napper, 60 inch, 16 rolls.
8 Jones Fleecers, 24 x 36 in.
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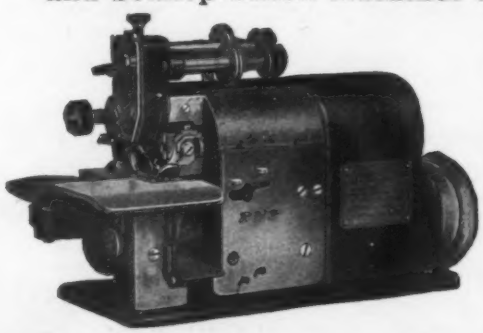
4 Hosiery Lever Presses.
42 Union Spec. Sewing Machines, various styles.
50 Loopers and Seamers, all makes.
60 Ribbed Underwear machines.
300 Hosiery Ribbers and Sleevers.

WRITE FOR COMPLETE LIST. APPRAISEMENTS A SPECIALTY.
We are always in the market to buy good second-hand Knitting and Finishing Machinery.

The Merrow

FAST
DURABLE
Light Running

High Speed Overseaming, Overedging and Scallop Stitch Machines are



OUR NEW STYLE 60 MACHINE for Trimming and Overseaming in one Operation produces the strongest, best Seam and does it with the greatest economy.

USE STYLE 18 for Horse Blankets.
STYLE 17 or 22 for Bed Blankets.
STYLE 35 B SHELL, for Necks and Fronts of Rib Goods, produces the most showy, substantial finish.

Send for Catalogue and Samples.

THE MERROW MACHINE CO. HARTFORD, CONN.

Knickerbocker Building, Sixth and Arch Sts., Phila. Room 321, 467 Broadway, New York

EXCELSIOR KNITTING MACHINE MFG. CO.

Meadow and Washington Streets

ALLENTOWN, PENNA.

BUILDERS OF

Full Automatic Knitters

With or without **Transferring Device**

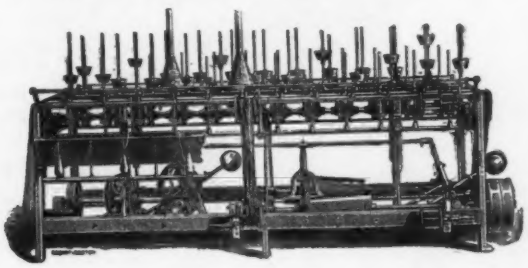
ALL SIZES AND GAUGES, 2 1-4 INCH TO 4 INCH

CIRCULAR KNITTING MACHINES

Either plain or full automatic, with stop motions complete. 4 to 24 feeds f r

RIBBED UNDERWEAR

Automatic Racking and Striping Machines for Sweaters, Cardigans, Collarettes, Cuffs and Anklets.



ALSO BUILDERS OF THE WELL-KNOWN

ABEL WINDERS, SEAMERS and LOOPERS.

LEIGHTON MACHINE CO., - Manchester, N. H.

The Invincible

Full Automatic.

"The KNITTER that KNITS"

THE LARGEST PRODUCER OF PERFECT WORK.
SIMPLE, POSITIVE AND EASY TO OPERATE.

E. JENCKES MFG. CO.

Pawtucket, R. I.

PHILADELPHIA OFFICE,
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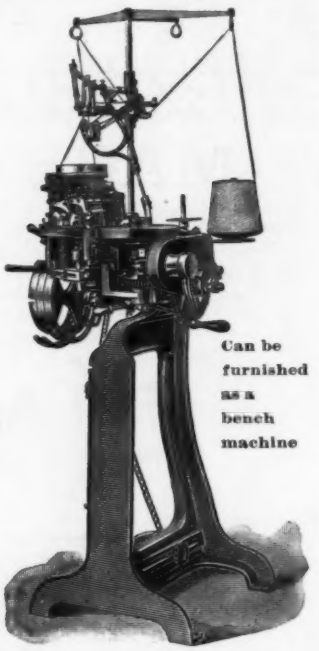
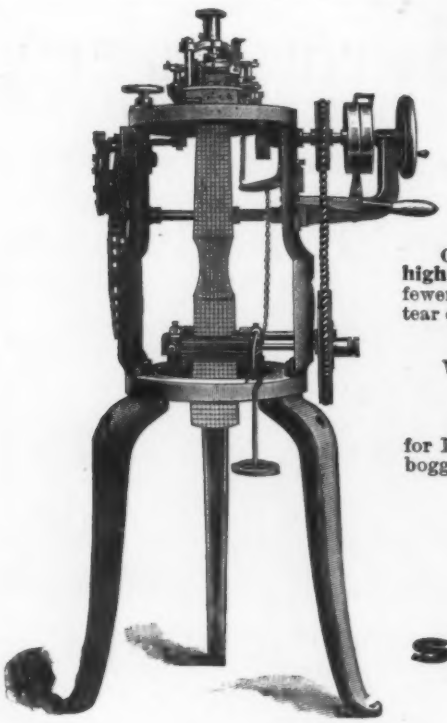


Can be furnished as a bench machine



High Speed Rib Knitting Machinery.

Our latest model machinery has been designed to run at very high speed, giving large production. This is accomplished with fewer seconds, less breakage of needles, less jar and wear and tear on machines than has been customary at lower speeds.

We also make Special

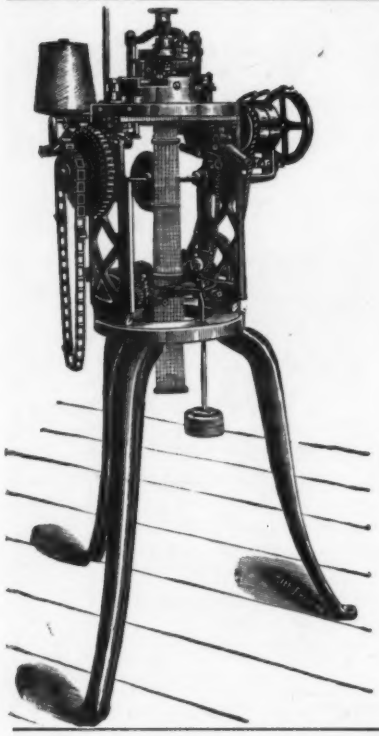
STRIPING AND DESIGNING MACHINES

for Fancy Golf Stockings, Bathing Suits, Sweaters, Toques, Toboggan Caps, Skirts, etc.

Our Machinery gives large production at low cost and enables manufacturers to meet the market always and make a profit.

STAFFORD & HOLT,

LITTLE FALLS, N. Y.



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213-215 Race Street, Philadelphia, Pa.

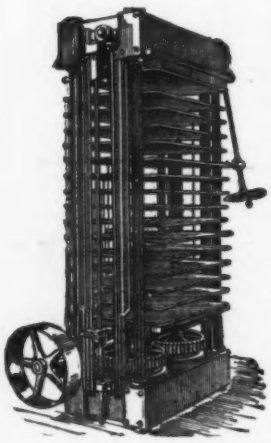
BUILDERS OF

Knitting Machinery

For HOSIERY and UNDERWEAR.

Complete Estimates Furnished. Send for Particulars.

The cut shows our **Improved Automatic Ribber with Welt and Slack Course** for Half Hose, Tops and Ribbed Legs.



Reliance Hot Plate Press

For Hosiery and Underwear Trade.

For price and particulars address

CHARLES HART

Hedge and Brown Sts., Frankford, Phila., Pa.

You Save Enough Insurance to Pay for the Equipment.

So it costs you NOTHING to have the AMERICAN WATCHMAN'S CLOCK. Fully approved by all insurance companies. We equip factories with Fire Alarms, Signals, etc., also Employee's Time Recorders, and Telephone Systems. Electric Time System consists of Master Regulator in office with secondary electric clocks throughout the mill, insuring accurate time. Send for particulars.

Pettes & Randall Co., 150 Nassau St., New York

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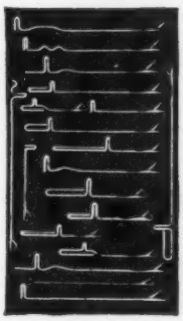

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Knitting Machinery

Flat and Circular Rib, both Spring and Latch Needle, Plain Circular Machines, Lead or Trick Cylinder, **Spring Needle Cylinder Rib-Top Machines** for making Cuffs, Drawer Bottoms and Shirt Borders. **Spring and Latch Knitting Needles, Burr Wheels, Burr Blades, Sinkers, Jacks, etc.**

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European Representative:
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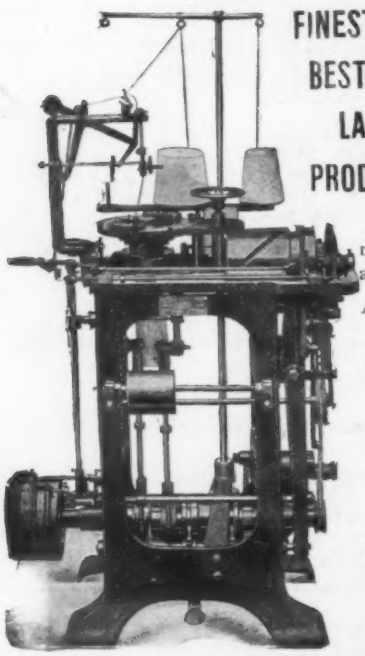
"NATIONAL"

Stands for



FINEST GAUGES
BEST FABRIC
LARGEST
PRODUCT ON

Greatest Variety of Laces and Novelties.

Allautomatic.

Lowest Cost for Operating

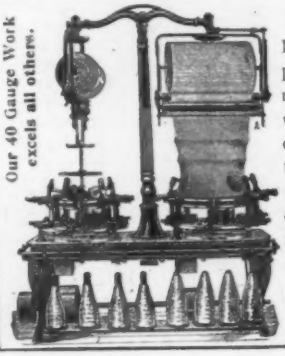
Also Rib Knitting Machinery, Overedge, Crochet and Shell Stitch.

NATIONAL AUTOMATIC KNITTER CO.

728 Cherry Street, PHILADELPHIA, PA.

We are the Oldest Manufacturers

of this Design of Spring Needle Knitting Machine in this Country



Our 40 Gauge Work excels all others.

40 years' experience

Do not be misled by people who became manufacturers in 1903 without any previous experience who are trying to represent that they are the oldest manufacturers. Investigate. Call and see our fine gauge work.

Robt. W. Gormly & Co.
Troy, N. Y.

The New Boss Seamless Knitter

Do you want the biggest production with the least menders, for the least money? If so, write to the Boss Knitting Machine Works for their circular with full directions. There is no cylinder to be handled. We use only one cylinder and transfer device for half hose or ladies' hose. This machine beats them all. Has no equal for simplicity and durability. Makes 300 revolutions per minute. Built in sizes from 2¼ to 5½; from 40 to 224 needles. Automatic in heel and toe. It is the strongest built knitter on earth.

Send for prices and particulars.

THE BOSS KNITTING MACHINE WORKS,
Cor. Elm and Reed Sts., Reading, Pa.

"Acme" and "Hemphill"

SEAMLESS HOSIERY

Knitting Machines

built by

Mayo Knitting Machine & Needle Company

Franklin, N. H.

Answer all purposes in the *most reliable*, *up-to-date*, and *economical* manner. Write us for full particulars.

Manufacturers like our Latch Needles

because we make a superior grade of needles.

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STANDARD MACHINES FOR HOSIERY MAKING

The STANDARD F, with attachments, can make any and all of these fabrics:

Plain Goods
Plaited Work
Three Color Stripes
Tipped Heel and Toe
White Foot
Changed Heel and Toe
Garter Top
Loopers Slack Course

Most Stockings—Best Fabrics—Longest Life

Standard Machine Company

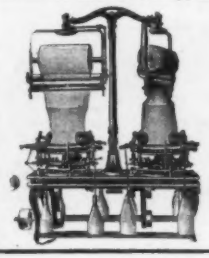
OFFICE AND SHOW ROOMS

330-340 North 12th St., Philadelphia

We Are the Oldest Manufacturers
IN THE WESTERN HEMISPHERE
Of Circular Spring Needle Loop-Wheel Knitting Machinery.

TOMPKINS BROS. CO., Troy, N.Y.

We submit the following extract from the sworn testimony of R. W. Gormly, in U. S. Circuit Court, Northern District of New York, in equity, No. 6764:
Cross Question 123. How long have you been a manufacturer of knitting machines? Answer. I started in this business about the middle of May, 1900.



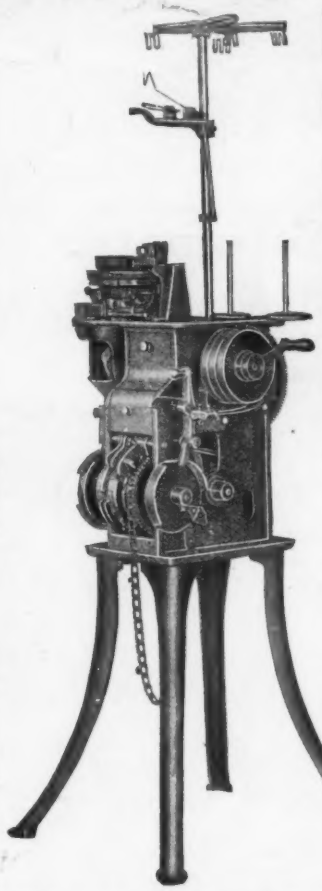
Tompkins Knitter

This design was adopted in 1875.
BUSINESS ESTABLISHED in 1846, before ROBERT W. GORMLY Was born, according to his testimony in the case above cited.

"THE BANNER"
Hemphill's Latest

A FULL AUTOMATIC MACHINE

Specially adapted to



Plaited Goods
and
String Work
also
High Splice
and
Double Sole

Largest Production
More Yarn Changes
Highest Speed
Simplest
Least Repairs

Produces a Superior Quality of Work.

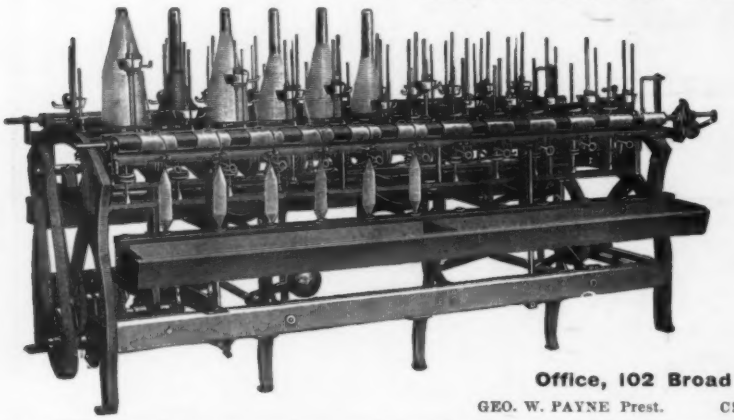
MANUFACTURED BY THE

Hemphill Mfg. Co.

131 Clay Street, PAWTUCKET, R. I.

OVER 1,900 PAYNE WINDERS IN USE

By Hosiery Manufacturers,
Wind for Cop, Skein or Bobbin.



Improved

Upright Spoolers,

To Spool from Cop, Skein or Bobbin.

Doubling Spoolers for doubling 2, 3, or more ends into one.

Upright Quillers, Quill from Cop, Skein or Bobbin.

Ring Dresser, Spooler and Reel Spindles, Cop Skewers, Warp, Spool, Spooler, Guides, Bolsters and Stops Made and Repaired at Short Notice.

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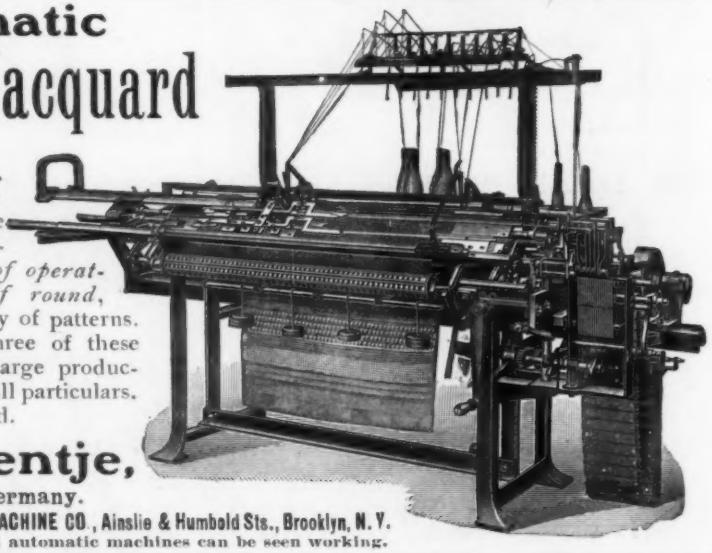
[Est. 1865. Inc. 1903.]

Office, 102 Broad Street, Pawtucket, R. I.

GEO. W. PAYNE Prest. CLINTON F. PAYNE, Sec'y. and Treas.

Full Automatic
Noppen & Jacquard



for high-grade sweaters, jerseys, etc. Latest improvements

Recognized as the best in the market. With Jacquard attachment allowing *change of operating mechanism every half round*, therefore unrivaled in variety of patterns. One operator attends to three of these machines. High speed. Large production. Ask for samples and full particulars. State gauge and size you need.

Claes & Flentje,

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Representatives, AINSLIE KNITTING MACHINE CO., Ainslie & Humbold Sts., Brooklyn, N. Y.

Where all kinds of our hand and automatic machines can be seen working.

HEPWORTH & CO.'S

Patent Single-Stitch

LOOPING MACHINE.

Needle working from the inside, avoiding the breaking of needles and points and picking up the metal.

Single and Double Stitch, or Both Combined.

JOHN W. HEPWORTH & CO.,

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PAXTON & O'NEILL'S

Full Automatic Knitter

FOR ALL KINDS AND GAUGES OF SEAMLESS HOSIERY.
RANGE ON HALF HOSE AND LADIES FROM 260 NEEDLES DOWN.

3-4 AUTOMATIC KNITTER

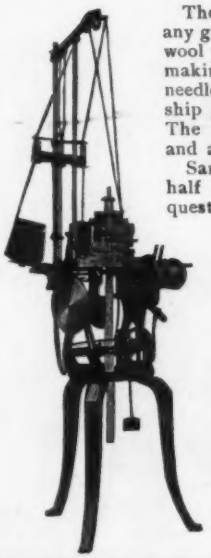
With Lace Effects.

Exclusive rights to BROWN'S LACE ATTACHMENT.

537-39-41 North 3d St., - - - - - PHILADELPHIA.

Use the Ruth

Ribber and Stop Motion



The Ruth Ribber will produce any gauge goods from cotton or wool yarn at a high speed without making bad work or breaking needles. Material and workmanship guaranteed to be first-class. The machine is easy to operate and adjust.

Samples of 240 needle gauze half hose tops furnished by request.

Many mills are pleased with our machine and we are sure we can please you.

Give us a trial. Write to-day.

RUTH
Machine Co.
YORK, PA.
G. W. RUTH, Manager

The CRAWFORD

HOLLOW STEAM
PLATE PRESS
For Knit or Woolen Goods.

The most reliable machine of the kind on the market.

PRESS PAPERS and FENDERS.

SPENCE & RIDEOUT,
Successors to
J. J CRAWFORD & SON,
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Established 1868.

Established 1870. — Incorporated 1890.

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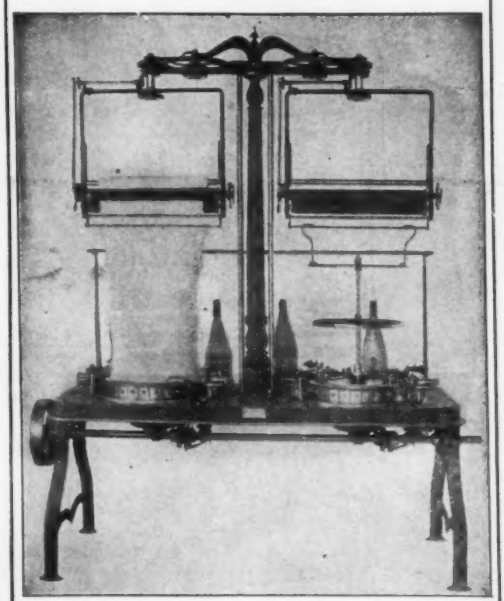
Manufacturers of

Spring and Latch Needle Machines for both rib and plain work, producing a great variety of fabrics. Patent removable hardened Wing Burr Wheels.



Spring Needle Underwear Machine.

If You Want

Largest Production For Least Money

Write

Geo. D. Mayo Machine Co.,

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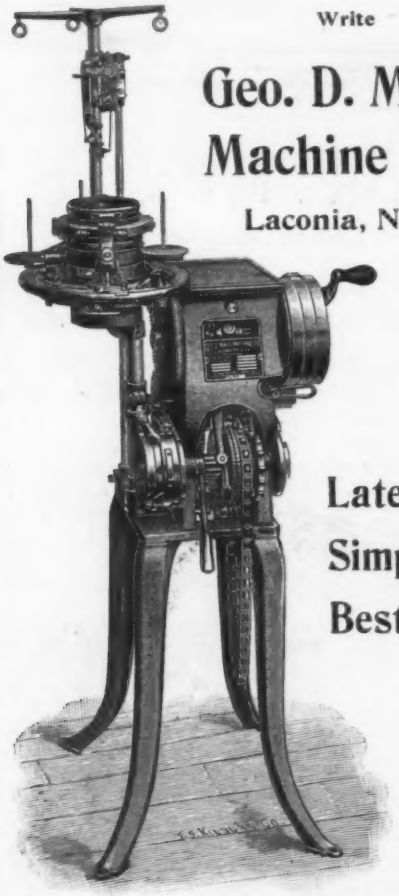

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Simplest
Best

MAYO'S

New Full Automatic Knitter

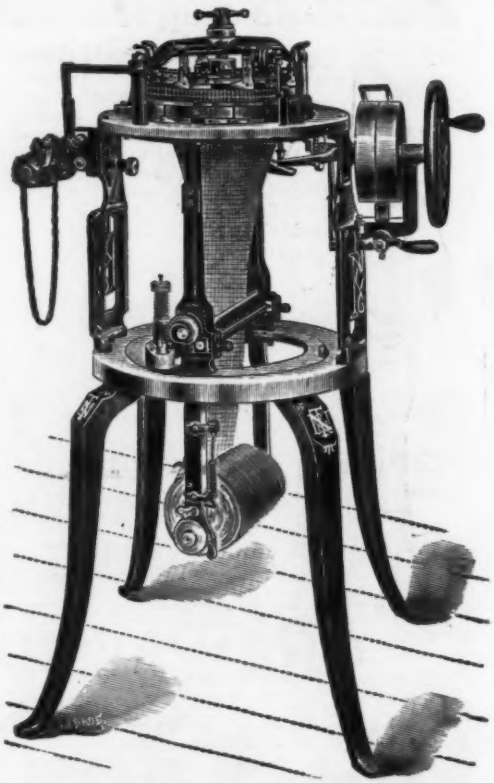
PHILADELPHIA OFFICE,
KNICKERBOCKER BLDG., COR. SIXTH AND ARCH STS.,
B. M. DENNEY, REPRESENTATIVE.

NYE & TREDICK CO.

Circular Rib Knitting MACHINERY

For making Ribbed Underwear, Combination Suits, Sweaters, Cuffs, Shirt Borders, Hosiery, etc. : ; :

Correct Construction. Excellence and Durability.



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QUALITY OF FABRICS AND PRODUCTION
UNEXCELLED

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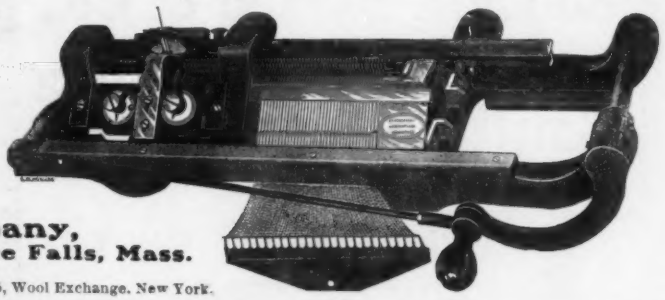
LEADER OF KNITTERS

Original and Still the Best.

Most widely used; being operated in every civilized country in the world. For description, prices, etc., see catalogue.



Circular Machines, Rib Top and Seaming Machines.

Lamb Knitting Machine Company,

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J. E. WOODHEAD, 100 22d St., Chicago.
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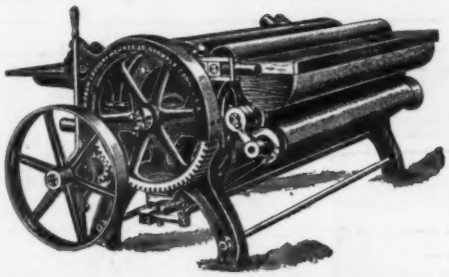
Of Proven Efficiency and Economy



AUTOMATIC IRONING AND PRESSING MACHINES FOR KNIT GOODS

No Broken Buttons

This machine irons and presses ribbed and flat underwear and other knit goods, giving a fine, smooth, attractive finish, which cannot be as easily obtained in any other way. It does not break buttons and can be adjusted to all grades. It is so easy to operate, so inexpensive to maintain and is of such large capacity that knitting mills throughout the country effect fully 50 per cent. saving through its use. For particulars, prices and list of knitting mills using our machinery address us at our factory.

Saves Half Your expense

The Consolidated H. S. & L. M. Company

South Norwalk, Conn.

Sole Manufacturers of the "Craw" Automatic Ironing and Pressing Machine

For Half Hose Tops Only

AUTOMATIC POWER TOP CUTTING MACHINES

Will cut, automatically, 1000 dozen half hose tops, or cut, and automatically pile in heaps of one dozen each, from 400 to 700 dozen misses tops, according to length per day.

ROBINHOOD MACHINE CO.

650 North 8th St., Reading, Pa.

For Half Hose, Misses and Childrens Tops

Patent Loopers

Both single and double Stitch. with the Patent Raised or Straight Points.

Beattie Machine Works,

Cohoes, N. Y.

CHARLES H. SCHNITZLER,

Patentee and Sole Manufacturer of

THE PNEUMATIC CONVEYOR

For the handling of wool and cotton stock, rags, excelsior, jute and all kinds of fibrous material, wet or dry. Also spool elevators, steam heating and ventilating, and mill work generally. Blower and fan work a specialty. This conveyor is patented. Beware of infringement.

SATISFACTION GUARANTEED Patented Oct. 15, 1889.

215 NORTH SECOND ST., - PHILADELPHIA, PA

SAVOGRAN

Cleans Wool, Floors, Anything.

INDIA ALKALI WORKS, Boston.

Edouard Dubied & Co.,

Couvet, Switzerland,

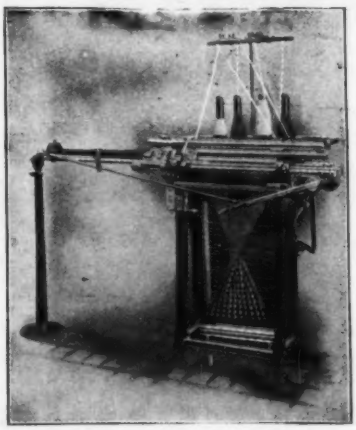
Knitting Machines,

Hand and Power.

HIGH CLASS WORK ONLY.

Paris 1900 "Grand Prix"
Milan 1906 "Grand Prix"

For catalogues and particulars apply direct to Couvet Works.



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BOARDS FOR FAST BLACK DYERS.

HOSIERY FINISHING BOARDS.

BEST WORK. PROMPT SERVICE. PRICES ALWAYS RIGHT.

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Hosiery Boards.

WILLIAM C. BULL, BENNINGTON, VERMONT.

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For Ladies', Gents' and Children's Goods.
Latest Styles.
Best Workmanship.

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OF EVERY VARIETY.

Soft Clear Water.

We-Fu-Go and Scaife Water Softening Plants, and Scaife Water Filters can be seen in actual operation in Textile Plants in any part of the U. S. Apparatus designed to suit each special case, and we guarantee results. Write for Illustrated Catalogue.

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COPPER

Printing Rollers
Singe Plates
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Taunton-New Bedford Copper Co.

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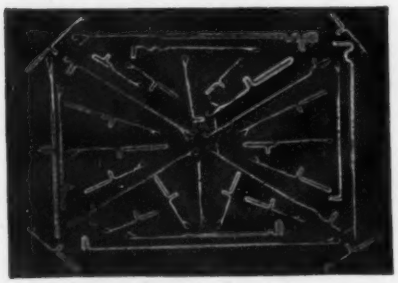
Our Guarantee:

Superior Quality. *Prompt Shipments.*

TRY OUR "SUPERIOR" OR SUNKEN RIVET-HEAD NEEDLES

They will save you money.



Dodge Needle Co., Manchester, N. H.

WM. COREY CO.,

Manufacturers of Knitting Machine

Latch Needles

MANCHESTER, N. H.

EXCELSIOR NEEDLES.

The best Hosiery Needles in the market.

Manufactured by

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AND BURR BLADES OF ALL KINDS.

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GAS ENGINES for city or country } EFFICIENT
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The Largest Manufacturers of Machine Needles in the World.

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Longer Wear. Better Work.
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Special Needles made to order.

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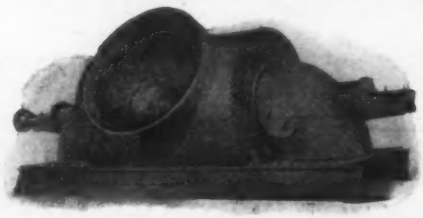
McCormick Turbines



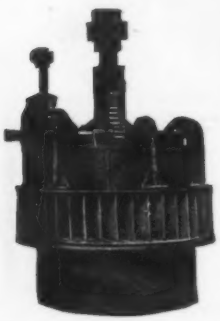
both Cylinder and Wicket Gate, giving **ENORMOUS** power are used in hundreds of textile mills throughout the world.

We make a specialty of designing turbines to meet the requirements of the public.

We build Francis turbines in spiral flumes to operate under high heads.

Boston Office, 176 Federal Street.

S. MORGAN SMITH COMPANY, York, Pa., U.S.A.



Risdon-Alcott Turbine Co.

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RISDON CELEBRATED TURBINE
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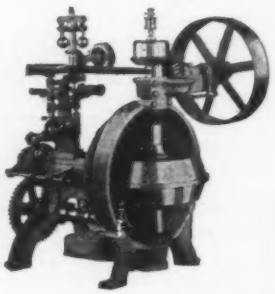
On Horizontal or Vertical Shafts.

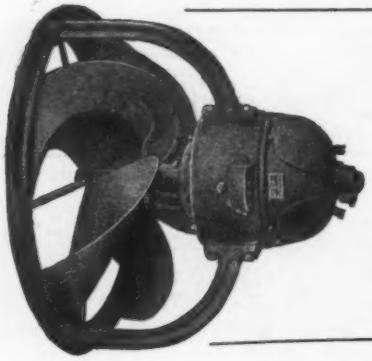
These Turbines are recognized as the most effective water wheels made. Your inquiries should come direct to us for this class of machinery.



Water Wheel Governors

OUR compensating type more fully meets the needs of Textile Mills than any other. This is due to its being the only successful quick acting, mechanical, governor and its perfect control of large as well as small changes. 1500 of this type in use in mills and electric power plants.

Woodward Governor Co., Rockford, Ill.



Davidson Electric Fans

can be equipped with any of the standard motors for direct or alternating current. They are carried in stock at local points. Greater opportunity for selection of exact type required is presented by the Davidson than by any other fan.

Massachusetts Fan Company

General Office and Works, Watertown, Mass.

Boston New York Chicago Cleveland Pittsburg St. Paul

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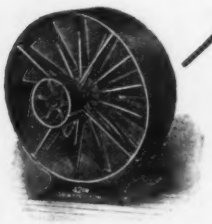


In textile mills the cost goes up with the temperature

Hot, stuffy, air takes all the "life" out of the operatives and greatly increases machines troubles. Keep cool, pure air constantly moving in every room.

Use "A B C" Disc Ventilating Fans

Full information upon request.

AMERICAN BLOWER COMPANY, - - - Detroit, Mich.

New York Chicago Atlanta London

SALEM ELEVATOR WORKS

SALEM, MASS.

ELEVATORS

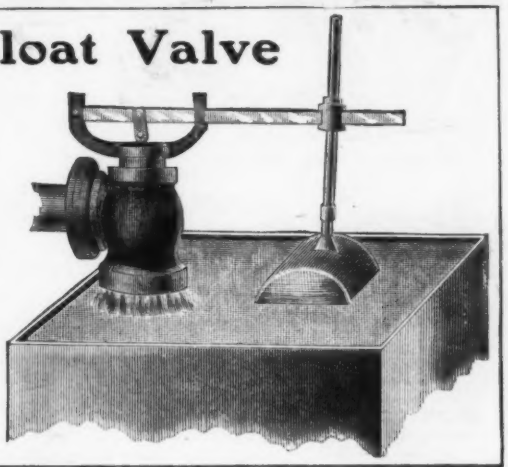
ESPECIALLY ADAPTED FOR MILL USE.

SEND FOR ILLUSTRATED CATALOGUE AND ESTIMATE.

The "Kellogg" Float Valve

Is Warranted Always to Operate

as it has no packing gland which can be tightened up to cause it to stick, thereby causing the tank to overflow. It is a balanced valve and operates with a smaller float than any other make of valve of the same size.



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500 East St., Holyoke, Mass.

Manufacturers of the Original "McCormick Holyoke Turbine." Both Vertical and Horizontal

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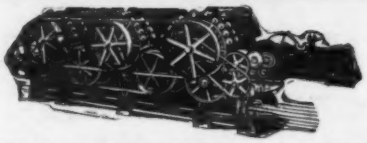
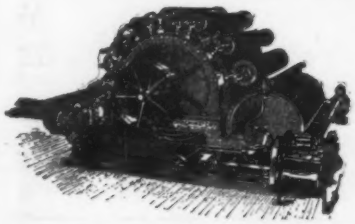
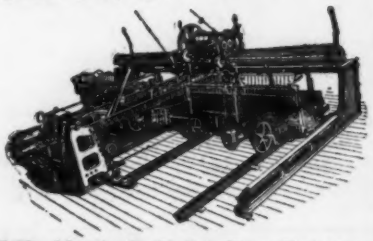


CARNETT MACHINES AND PICKERS

For reducing to Fibre Cotton and Wool Waste, Cloth Clippings, Etc.



WOOLEN MILL MACHINERY



Including Rag, Wool and Burr Pickers, Wool, Worsted and Shoddy Cards, Mules, Yarn Twisters, Warpers, Dressers, Spoolers, Etc.

Complete Equipment for Manufacturing Cotton Batting for All Purposes.

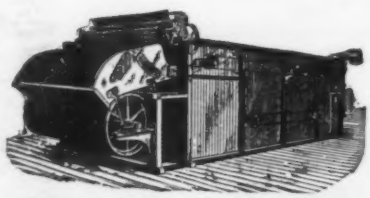
Special Carding and Spinning Machinery for manufacturing Yarn from such low grade stock as Mill Sweepings, Linters, Etc.

We reclothe or furnish new Metallic Toothed Cylinders and Rolls and relagg or furnish new Cylinders for any make of Rag Picker.

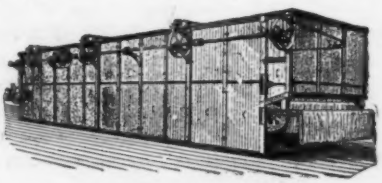
SMITH & FURBUSH MACHINE CO., Hancock and Somerset Streets, **PHILADELPHIA, PA., U. S. A.**

"CYCLONE" DRYERS

For Cotton Stock, Wool Stock, Rags, Yarn, Cloth Underwear, Stockings, etc.



Automatic Cotton or Wool Stock Dryer.



Automatic Yarn Dryer.

Steel Bladed Ventilating Fans.

Iron Bowl Yarn Scouring Machines.

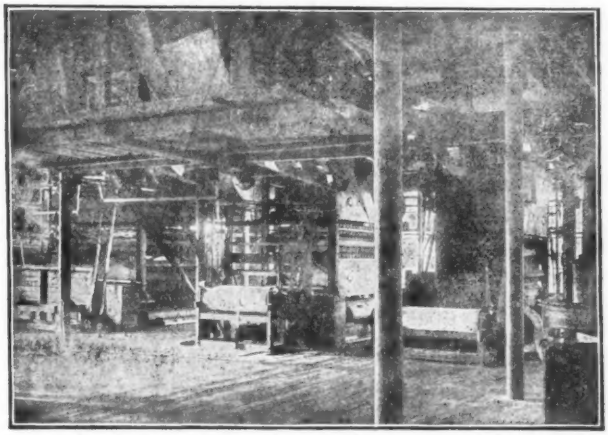
Complete Carbonizing Outfits for Wool, Rags or Cloth.

THE PHILADELPHIA TEXTILE MACHINERY CO.,

Hancock and Somerset Streets, PHILADELPHIA, PA., U. S. A.

CELL DRIER MACHINE CO.
TAUNTON, MASS.

An 8-foot Cell Machine Equals a 55-foot Cylinder Machine
Heavy Fabrics may be Dried at 125-Yard Speed



CELL DRIER INSTALLED IN A PROMINENT COTTON MILL.

THE CELL DRIER is the most efficient machine on the market for drying yarn or cloth of all grades and weights. It has come rapidly into favor, replacing the cumbersome cylinder machines and affording marked economy in cost of operation, and in floor space covered, in labor, power and repairs. It utilizes steam to the highest advantage and without complicated piping. It operates with positively driven rolls, has easily adjusted tension and does not strain the goods.

Write for photographs of Cell Drier installations with full particulars and estimates

THE CELL DRIER

Foster Machine Company

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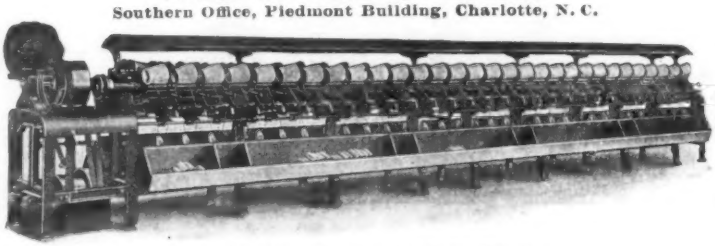
Cone Winding.
Tube Winding.
Skein Winding.
Quill Winding.
Doubling.



Both "Open" and "Close" Winding Machines for every branch of textile manufacturing.

New Model No. 12 Cone and Tube Winder.

Rae's "New Century" Cards

1. More carding on our 2-card set than on 3-card set, old style.
2. More and better mixing than on any other card made.
3. Less waste, less power, less room, less card clothing.
4. The only improvement on cards that has been proven a success. Come and see them running.

The Lombard Machine Co.,
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We have the Largest Exclusive Spool Manufacturing Plant in the World with a capacity of 10,000 High Grade Bushed Spools per day.

Our splendid facilities guarantee prompt and immediate deliveries. Our equipment, than which no better exists, guarantees the highest grade of all hard wood spools of the highest quality procurable at medium prices.

COTTON WARPER SPOOLS, COTTON TWISTER SPOOLS, WORSTED ROVE SPOOLS, CARPET CREEL SPOOLS, WORSTED REDUCER SPOOLS, WOOL WARP SPOOLS.

We can give one week deliveries on any order of the above kinds of spools.

Lestershire Spool & Manufacturing Co.,
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HIGH PRESSURE

VALVES AND FITTINGS

"Walmanco" Pipe Flanges
"Never Stick" Blow-off Cocks, Mill Supplies.

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